DESCRIBING AND EXPLAINING CROSS-NATIONAL PUBLIC OPINION ON CLIMATE CHANGE

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Political Science – Doctor of Philosophy

2015

ABSTRACT

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Climate change could be the most important international public policy challenge of the 21st century. Its consequences, from rising seas to more violent storms, could change economies and societies. And it is an international problem requiring an international solution. So understanding global public opinion on climate change is important to understanding how the international community might respond. But global public opinion on climate change remains under explored. This project tackles two questions. First, what explains cross-national public opinion on climate change? Second, how does American public opinion on climate change situate in the comparative context?

Around the world, people are concerned about climate change but not alarmed. Although large majorities express that climate change is dangerous and serious, only small minorities see the environment and climate change as issues more important than the economy, health care, or even pollution. Climate change is not a front-burning issue. There is important variation around the world in how people perceive the risks of climate change too. Those with more education and on the political left are more likely to say climate change is a serious problem than those with less education and on the political right. Citizens of richer countries, however, are not more likely than citizens of developing countries to say climate change is serious, so policymakers should not assume that publics in wealthy countries will accept greater sacrifices as part of a climate change policy solution.

Compared to other wealthy countries, the percentage of Americans who say climate change is not serious and dangerous stands out. Americans are also unlikely to be willing to pay higher prices to address climate change and rank the environment and climate change as more important than other issues. What explains why Americans are comparatively less worried? The American public is far more ideologically polarized on climate change, with many Americans seemingly taking cues from political

similar elites. The most politically engaged and knowledgeable Americans are the most divided by ideology and party affiliation. And in no other wealthy countries is the public so polarized on climate change. The deep polarization in the United States figures to be an obstacle to international policy addressing climate change.

To Mom, Dad, and Craig—thank you for everything

ACKNOWLEDGMENTS

I did not go to graduate school to study public opinion on climate change, the environment, and energy. I'm not sure how I got here, but I'm glad I did. I'm so excited to continue research on these topics in years ahead.

I would first like to thank my dissertation committee chair, Charles Ostrom, for his support, guidance, and encouragement in the process. He was a constant source of confidence throughout my graduate school career. Chuck was completed committed to this idea and the plan, providing faith numerous times when I wavered. It is great to see it all work out, and it wouldn't have without Chuck. I'm also not sure who I'll talk basketball with on a regular basis now.

I would also like to thank other faculty members who at one time or another served on my committee: Cory Smidt, Mike Colaresi, Josh Sapotichne, and Paul Abramson. All were generous with their help and a pleasure to work with. Cory played an especially important role in my graduate school career, inspiring my strong interest in quantitative research methods and providing a supportive comment when I needed it most.

Many other political science faculty members at Michigan State helped me over the past six years. Thanks to them all. I would like to particularly thank Valentina Bali for allowing me to teach in and get involved with the Public Policy Program over the last two years. This opportunity helped me directly and indirectly finish.

I was extremely lucky to have many great graduate student colleagues during my time at MSU. I'm so grateful for my friendship with Jerry Lavery. Without Jerry's friendship, this would have never happened. I'm beyond excited we are reunited. Other colleagues and friends—Bob Lupton, Melanie Whitley, Masaaki Higashijima, Chunho Park, Sung-Min Han, and many others—contributed in so many ways without knowing it.

I would also like to thank friends from outside my graduate school world for their support throughout the process. To my "DC" friends—Matt, Matt, Amy, Paul, Sarah, Joel, and Molly, thanks for

the laughs and visits that were too far in between coursework, comprehensive exams, and dissertation writing. Luckily, they will be more frequent now. To my Davidson roommates—Richardson, Garrett, and Chris—thanks for all the help over the years and allowing me the opportunity to attend two of your weddings and one Kiawah weekend during my graduate school years. It is hard to believe that we met 13 years ago this week. Thanks also to all my second Belkers, including the incomparable Teddy, for taking my money in fantasy football and reminding me that I was always more than a graduate student.

Last, thank you to my brother Craig for years upon years of direct encouragement. Indirectly, his great success is a great source of inspiration. And my parents provided so much support from so far away during this journey, beginning more than a quarter century ago in kindergarten. Thanks for encouraging me to keep going, from Davidson to DC to graduate school and back to DC, through good and bad times. I think I'm done with school now. This is dedicated to the three of them.

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1.1 Why climate change

Climate change could be one of the most important international public policy issues of the 21st century. Scientific evidence supporting climate change has accumulated over the past decade and a strong scientific consensus that climate change is the result of human activity has emerged. About 97 percent of climate scientists agree on anthropogenic climate change (Anderegg, et al. 2010). If climate change is not addressed in a meaningful manner, its consequences could be devastating for human life (Giddens 2011). The Intergovernmental Panel on Climate Change of the United Nations (IPCC), in its 2007 report, claimed the effects of climate change already included glacial lakes, melting ice sheets, and major changes in the Arctic and Antarctic ecosystems. It warned of future consequences including the flooding of coastal cities, resource-based wars, and more extreme, violent weather. Some of the damage could result in irreversible changes. Climate change of this magnitude requires a global response and major policy changes.

A major policy initiative requires committed politicians and a supportive public. Public opinion is important to policy making, especially in democracies. V.O. Key considered government responding to public opinion in policy making a crucial element of democracy: "Unless mass views have some place in the shaping of policy, all the talk of democracy is nonsense" (Key 1961). The public, both in the United States and around the world, plays and plays an undeniably important role in shaping the policy response to climate change. Climate change is a global problem requiring an international response. The global public could drive an appropriate response or impede such an appropriate response. Public opinion, including policy preferences and substantive attitudes, could determine the policy response to climate change.

Understanding global public opinion is important to public policy on climate change, yet it is underexplored. We still do not have a clear picture as to how so many people around the world think about climate change and what influences their opinions. This project seeks to provide clearer picture of public opinion on climate change in two ways: by studying cross-national public opinion and United

States public opinion in comparative perspective. Public opinion on climate change will determine the available options to mitigate the consequences of climate change for policymakers in democratic countries (and even non-democratic countries), where policymakers are more likely to be responsive to the public.

This project also contributes to the study of public attitudes on complicated environmental and science issues. Complex science issues other than climate change, such as childhood vaccines and genetically modified foods and energy issues, such as nuclear, wind, and solar power, are often prominent topics in the news. And some people reject scientific consensus on all of these issues, including climate change. Why do some individuals in the United States and cross-nationally reject the scientific consensus on climate? Are those skeptical of anthropogenic climate change persuadable? These questions are also important to this project on people's attitudes on climate change specifically and insights on climate change could extend to other science and environmental topics.

1.2 Important insights

This project focuses on the following questions: What do people think of climate change? How do people form opinions on climate change? And how does American public opinion on climate change compare to the rest of the world? Based on my analysis, this project comes to these conclusions.

- The public, both in the United States and around the world, express worry about climate change in the abstract. Large majorities in cross-national surveys consider climate change serious and dangerous. But, the global public across cross-national surveys is far more reluctant to make an economic sacrifice to address climate change and ranks different general policy priorities and environmental issues as more pressing. Even among those most concerned about climate change, other issues and environmental problems are ranked as more important than climate change. For many Americans and those around the world, climate change is a vague, weak worry, often trumped by immediate, everyday-life general concerns like the economy, health care, and more pressing environmental concerns such as local air and water quality. Why does the public in the United States and around the world express concern about climate change but also consider it unimportant? Unlike many public policy issues, such as guns and even pollution, climate change is both complex and abstract. Climate change is a complicated issue and many citizens do not possess adequate information to form decisions on it. Moreover, unlike local air and water pollution, climate change is not concrete; there are not visible and unequivocal indicators or even long-term visible consequences. People cannot see or feel the consequences of climate change, even if they sometimes think of climate change during a particularly miserable heat wave or late season hurricane. They are concerned with the consequences of climate change, but at the same time cannot completely understand these consequences, so climate change is less important than more immediate issues. In general, the global public is concerned but not alarmed about climate change.

- Both individual characteristics and context influence climate change opinions. People more likely to pay attention to climate change are also more likely to consider climate change serious and important on average across countries (the influence of engagement is more complex in the United States). More educated individuals say climate change is serious and dangerous and more likely to rank both the environment and climate change important issues than less educated individuals. Context matters and does not matter in important ways. Citizens in wealthier countries are not more concerned or more likely to be willing to pay more to address climate change, so the assumption that wealthier countries would be more willing to take on greater burdens in an international climate change policy response is problematic. But wealth and development does shape the importance of left-right political orientation on concern about climate change. Climate change has become a left-right political issue in only wealthy countries, another possible obstacle to a meaningful policy response by the wealthiest countries.
- American public opinion on climate change is an outlier compared to other wealthy countries. The group of Americans who consider climate change not serious and dangerous is much larger than in other wealthy countries. Why is this group so large? The political and media elite are far more polarized on climate change in the United States than in other wealthy countries. The

Republican Party in the United States is the only political party in an affluent country to so outwardly reject climate change, consider it unserious, and reject policy response options. And the mass public is aligned with ideological elites in the U.S., so American public was far more ideologically divided than in other wealthy countries. And this ideological divide increased as engagement with politics and climate change increases. As engagement increased, liberals become more worried and conservatives less worried, a pattern not observed in any other wealthy country.

1.3 Chapter outline

This section briefly describes the remaining seven chapters in this project. Chapter 2 describes the great variation in public opinion about climate change around the world. It shows that while publics around the world expressed a high level of concern on numerous surveys, this. People are generally extremely reluctant to support economic sacrifice for climate change, and considered other environmental problems like pollution and issues such as health care more important than climate change. In addition, the American public stands out for its lack of concern about climate change. Across numerous surveys, far more Americans are unconcerned about climate change than in publics of similarly wealthy and developed countries.

Chapter 3 then explores the literature on environmental concern generally and climate change specifically on the United States and cross-nationally. The literature offers contradictory expectations for the influence of many important factors, such as religiosity, affluence, and post-materialism.

Chapter 4 then tests these competing explanations for climate change risk perception using cross-national public opinion data, coming to three important conclusions. First, among country characteristics, country affluence does not increase concern in either of the cross-national surveys; on average citizens in wealthier countries are not more concerned about climate change than citizens in less wealthy countries. Second, education has a strong association with climate change risk perception, as more educated individuals considered climate change more serious than less educated individuals on average across countries. Policymakers crafting international agreements on climate change should not assume that citizens of wealthy countries are willing to make greater sacrifices. Third, general left-right political orientation is associated with climate change risk perception, as those on the left were more concerned than those on the right on average.

Chapter 5 explores the substantial cross-national variation in the association between left-right political orientation and climate change risk perception in more detail. It shows this variation can be explained by country-level wealth and development. Using multilevel cross-level interaction models, I show that among low and middle income countries, left-right political orientation generally is not related to concern about climate change, but left-right political orientation significantly and substantively predicts perceived seriousness of climate change for affluent and highly developed countries, a finding that could be attributed to the closer connection between political ideology and positions on economic issues and climate change in wealthy countries. This shows that climate change is a left-right political issue in many of the wealthy countries in Western Europe and Anglophone countries. The left-right divide in these countries could be an obstacle to any meaningful climate change agreement.

Even among wealthy countries, the left and right are far more divided on climate change in the U.S. than in other wealthy countries, so there is a distinct factor driving public opinion in the United States. In Chapter 6, I argue that elite polarization drives mass polarization in the United States, as the American public uses elites as an information shortcut on climate change. In the United States, unlike any other wealthy country, I show the ideological divide between the left and right increased as political engagement increases, evidence that those who are most engaged are most likely to pick up on their respective ideological cue.

Chapter 7 first looks at the relationship between opinions on climate change specifically and environmentalism generally. People around the world and in the United States generally related their worries about climate change to their worries about other possible environmental problems, most prominently the dangers of air pollution. Then focus of this chapter shifts to the relationship between climate change attitudes and intended behavior. Even though increasing perceived dangerousness does increase the likelihood of both willingness to pay to address climate change and ranking the environment and climate change as important, the size of this effect is modest. Cross-nationally, of those individuals who consider climate change dangerous/serious, a small majority is willing to pay higher prices to help address climate change and a large majority rans issues other than the environment and environmental problems other than climate change as more important. Moreover, climate change risk perception does not predict ranking the environment and climate change as most important in poorer and less developed countries, demonstrating that the very high public concern in many developing countries may be an illusion. Climate change is not a front-burning issue for both many worried individuals in rich countries and many citizens of developing countries, two important constituencies that could be needed to support an international agreement.

Chapter 8 is the conclusion, summarizing the key findings, including ways in which global public opinion acts as aid and an obstacle to an international policy response. It also offers policy options likely to have public support and proposes key questions for future research.

Chapter 2: How important do people consider climate change?

2.1 Introduction

Scholars of American public opinion on the environment and climate change can provide a detailed description of public attitudes and behaviors on climate change (Marquart-Pyatt, et al. 2011, McCright and Dunlap 2011, Guber 2013). They can answer important questions such as who believes climate change is happening, who believes climate change is caused by human behavior, what the level of concern is among Americans, and who supports climate change mitigation policies. The amount of survey data available to these scholars is increasing as climate change becomes a more prominent public policy issue. Public polling organizations such as Gallup and Pew Research regularly ask respondents for their views on climate change.[1] The U.S, however, is only one country in the international community. And climate change is a global public policy challenge requiring an international response. These scholars of American public opinion also cannot situate American public opinion in the cross-national context. Without comparison to other countries, it is hard to provide meaning to description. Studying only American public opinion leaves important holes.

The cross-national work on climate change public opinion is still at a nascent stage. Until the last decade, there were only a limited number of cross-national surveys which asked respondents about climate change. These studies often covered only a handful of relatively homogeneous countries, and they mostly asked respondents about climate change risk perception, by capturing perceived level of dangerousness, seriousness, concern, and worry. As the scientific evidence that climate change is happening and the result of human activity, climate change has become a more pressing policy issue. And interest in studying cross-national public opinion on climate change has subsequently followed. The number of surveys asking questions about climate change and the number of countries covered has increased dramatically over the past few decades. These new comparative surveys provided a more

[1] The Yale/George Mason climate change communication project also regularly surveys Americans for their opinions and attitudes on climate change.

detailed picture of global public opinion on climate change generally and specifically how the United States compares to other countries.

This chapter, through detailed description, adds to the basic understanding of cross-national public opinion on climate change. What do mass publics around the world make of climate change? And how does American public opinion compare to other countries, especially other wealthy countries? This chapter answers these questions, using six different cross-national surveys from 2005 to 2011 to show that public opinion on climate change is complex. Many individuals in dozens of countries broadly seem to be weakly concerned about climate change (Bord, et al. 1998, Ansolabehere and Konisky 2014). What do I mean by weakly concerned? I define weakly concerned individuals as those who say climate change is serious or dangerous when asked, but also stating they were unwilling to accept economic sacrifices to address climate change and also ranking other issues as more important than climate change. Across these surveys, most respondents told interviewers that climate change is serious or dangerous, but far less responded that the environment and climate change are most important issues. And individuals across countries are reluctant to make economic sacrifices for climate change. So many seem concerned but not alarmed about climate change.

As for the United States, by situating American public opinion in the comparative context, this chapter shows that Americans are uniquely unconcerned about climate change. A majority of the American public is also uniquely unwilling to sacrifice economically to address climate change. And only a comparatively small number of Americans consider climate change to be the most important environmental problem facing the United States. For activists and policymakers who care passionately about addressing climate change, the American public does not seem like a vehicle to use to achieve their goals, but instead an obstacle that must be overcome.

2.2 Previous work describing global public opinion on climate change

First, despite its limitations, I describe the initial work describing cross-national public opinion on climate change from the late 1990s and early 2000s as it provided the foundations for future work. Dunlap (1998) used data from Gallup's 1993 *Health of the Planet* survey to look at the public's view on climate change in six countries: Canada, the United States, Mexico, Brazil, Portugal, and Russia. He found that the publics in these countries viewed global warming as a problem, but not as big or serious of a problem as other environmental issues, such as the depletion of the ozone and destruction of the rain forest. In addition, Dunlap reported that most people did not understand climate change in these six countries. Many respondents linked climate change with air pollution and chlorofluorocarbons (CFCs), the main cause of ozone depletion (Ozone depletion was a prominent environmental problem in the 1980s and 1990s). Few people linked climate change with its actual main cause, the burning of fossil fuels, which is not surprising considering that climate change was a nascent issue at the time.[2]

That same year, 1998, Bord, Fischer and O'Connor (1998) compared an original 1997 survey from the United States with the 1993 *Health of the Planet* cross-national surveys. Similar to Dunlap, they found that individuals across countries were similarly unconcerned about climate change and considered it to be less important than many other environmental issues. As the authors write, climate change was not "a front-burning issue." These two early studies described mass publics around the world as misinformed and unconcerned about the dangers of climate change.

Brechin (2003) updated the work of Dunlap (1998) and Bord and his co-authors (1998), using multiple cross-national surveys to compare public opinion on climate change in the United States to other countries around the world. He found that the United States appeared to be "out of step" on climate change compared to European countries, especially on level of support the American public had for the Kyoto Protocol (2003, 107). In addition, Brechin showed that Americans were among the least likely to correctly identify the cause of climate change compared with citizens of other developed nations. In 2001, in the Environics International study of 15 countries, 26 percent of Mexicans correctly identified fossil fuels as the cause of climate change, while only 15 percent of Americans were able to answer this

[2] When the survey was administered, respondents were allowed to mention two causes when volunteering causes of climate change. 31 percent of respondents in Canada mentioned climate fossil fuel use; 20 percent of respondents in the United States; 5 percent of respondents in Mexico; 10 percent of respondents in Brazil; 14 percent of respondents in Portugal; and 23 percent of respondents in Russia. A larger percentage of respondents mentioned air pollution as a cause for climate change in every country: 43 percent in Canada; 39 percent in the United States; 34 percent in Mexico; 43 percent in Mexico; 49 percent in Portugal; and 36 percent in Russia.

question correctly. Of the highly developed countries, only respondents in France and Japan were more misinformed about the cause of climate change than Americans. Brechin demonstrated that the American public opinion on climate change might be unique.

Although these early studies provide a foundation for which to understand cross-national public opinion on climate change, they still have serious methodological limitations. First, they often included a limited sample of countries, and these countries are usually richer and more developed. So these cross-national studies did not give us more than a brief outline of public opinion on climate change in the developing world. In addition, in some of these countries, due to cost constraints, urban areas were oversampled or sometimes urban areas were the only parts of the country sampled. Fortunately, since climate change has become a more important environmental issue, it has been the focus of numerous cross-national public opinion surveys in the last decade.

2.3 Data

The rest of this chapter builds on the early work describing cross-national public opinion with more recent cross-national public opinion surveys, which cover a larger and more diverse group of countries. I use six cross-national public opinion surveys conducted between 2005 and 2011 to describe public opinion around the world and situate American public opinion in the comparative context.[3] Specifically, this section will draw from the Global Attitudes cross-national surveys from the Pew Research Center (Pew Global Attitudes) in 2007, 2008, 2009, and 2010, the World Values Survey (WVS), which was administered between 2005 and 2009, and the International Social Science Programme Survey (ISSP), which was conducted between 2009 and 2011. More information on the data sources is included in Appendix A.

I look at three important survey questions on climate change. First, all six cross-national surveys have measured an individual's risk perception about climate change, although the question wording is different. Risk perception, which broadly covers concern or worry, is an important measure of public

[3] In section 2.6, which discusses climate change public opinion over time, I also use additional public opinion surveys from the United States.

opinion on climate change.[4] I also compare the perceived dangerousness and seriousness of climate change to the other environmental problems, such as air pollution, water pollution, and genetically modified crops. Second, respondents to the Pew Global Attitudes surveys were asked about their willingness to pay to address climate change. This question captures willingness to move words of concern into action in the context of survey research, so it is a measure of intended behavior. Third, respondents to the ISSP survey were asked to name what issues they consider to be the most important and next most important, with the environment as a response option, and what environmental problem what they consider to be most important for their country, with climate change as a response option. This question captures how strongly individuals care about climate change, as it forces individuals to choose an issue or problem that they believe is most important.

2.4 Describing global public opinion

This section looks at cross-national public opinion for all countries included in the surveys. The goal is to describe global public opinion on climate change, ignoring differences across countries, so this section is not comparative.

2.4.1 Climate change risk perception

On all six surveys, despite differences in question wording, respondents in dozens of countries expresses a high level of perceived seriousness or dangerousness of climate change.[5] The distribution of

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[4] Unfortunately, more recent cross-national surveys have not consistently asked questions to test the knowledge and understanding of respondents on climate change or support for climate change mitigation policies. It would have been very helpful to have data on these questions.

[5] Question wording effects are important to consider in survey research. In the four Pew Global Attitudes surveys and the WVS, respondents were asked how serious climate change is. For the ISSP, respondents were asked how dangerous climate change is. These words, of course, have slightly different meanings. Individuals can consider a problem serious without viewing it as dangerous. Dangerous is a higher threshold, so it is not surprising that concern seems lower in the ISSP surveys than it the other surveys.

The response categories are also different across the six surveys. Both Pew and WVS have four response categories, and both have "somewhat serious" and "very serious" as two categories. The two organizations phrased their lower two categories differently: Pew uses "not serious at all" and "not very serious", while WVS uses "not a problem" and "not too serious". The biggest difference, once again, is between the ISSP and other surveys. The ISSP uses five response categories instead of four, including "extremely dangerous", going beyond the top response category of "very". This additional response category at the end of the distribution helps explain why the distribution for the ISSP question seems less skewed.

Next, research on public opinion in the United States found question wording effects based on whether the question referenced "global warming" or "climate change" (Schuldt, et al. 2011). The earlier surveys use "global responses is heavily skewed toward considering climate change a serious or dangerous problem. Figure 2.1 shows the distribution of perceived seriousness or dangerousness in each of the six cross-national studies from a variety of countries.[6] In all four Pew Global Attitudes surveys, a majority of respondents consider climate change “very serious”, the most concerned response category. At least 87 percent in all four surveys call climate change “somewhat serious” or “very serious”. This leaves only a small minority in the bottom two response categories. In the four Pew Global Attitudes surveys, between 2 and 4 percent and 7 and 10 percent, depending on the survey year, respond that climate change is “not a problem” or “not very serious” respectively.[7]

The distribution of responses for the perceived seriousness of climate change for the World Values Survey is similarly skewed. The World Values Survey asked respondents about their perceived seriousness about three environmental problems, including climate change, for the world as a whole in 44 countries. Only two percent of respondents consider climate change “not serious” and eight percent consider climate change “not very serious”. Many more view climate change as a serious problem. Specifically, 30 percent say “somewhat serious” and 59 percent say “very serious.” The distribution of climate change risk perception is less skewed for the ISSP, which included 32 countries, as it included five response categories instead of just four, and asked about dangerousness instead of seriousness. The lower level of the distribution is similar to those of the other questions, as only 10 percent consider climate change “not dangerous at all” or “not very dangerous” (two percent answer that climate change is “not and dangerous at all” and eight percent answered “not very dangerous”). But with the additional

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warming” while the more recent surveys use “climate change”. Specifically, the WVS and 2007, 2008, and 2009 Pew Global Attitudes surveys reference “global warming”, while the 2010 Pew Global Attitudes survey and ISSP reference “climate change”.

Obviously there are also translation and cultural effects in cross-national research. Although these topics are important for research, they are not the focus of this project.

[6] Pew Global Attitudes surveys include a question about respondent perception of the seriousness of climate change in 37 countries in 2007, 24 countries in 2008, 25 countries in 2009, 22 countries in 2010.

[7] It seems reasonable to assume that risk perception is connection to responses to other questions on climate change. For example, those who do not consider climate change serious or dangerous are likely to not take the possible consequences seriously and unlikely to support the implementation of mitigation policies, but there are no available questions on cross-national surveys to test this assumption.

response category, responses are more dispersed. Twenty-six percent of respondents say climate change "somewhat dangerous", 36 percent say "very dangerous", and 28 percent say "extremely dangerous."

Overall, the responses across these six cross-national surveys show the world is concerned about climate change. A majority of respondents say climate change is either "very serious" or "extremely dangerous" or "very dangerous" across all six cross-national surveys. These descriptive findings should be encouraging for climate change activists, as the public expresses that climate change is serious, at least in isolation when answering a survey question. Responses to other survey questions on climate change should be more worrying to policymakers and activists around the world who want to address climate change

Figure 2.1: Perceived seriousness or dangerousness of climate change in all countries (Pew Global Attitudes Surveys 2007-2010, World Values Survey 2005-2009, International Social Survey Programme 2009-2011)

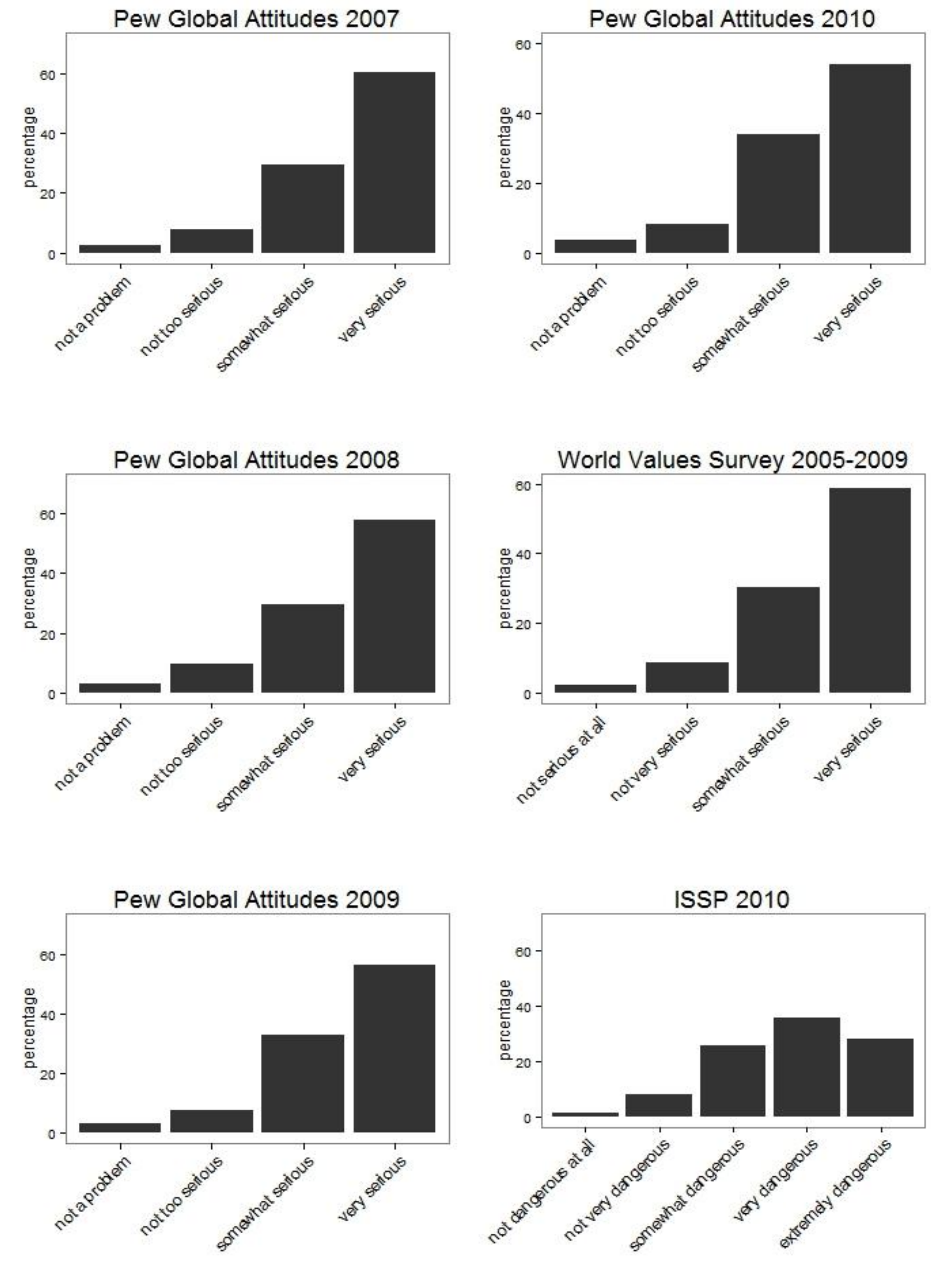


Figure 2.1 (cont'd)
Questions: *Pew Global Attitudes 2007, 2008, 2009:* "On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?" *Pew Global Attitudes 2010:* ""On another topic, in your view is global climate change a very serious problem, somewhat serious, not too serious, or not a problem?" *WVS:* "Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or the greenhouse effect". *ISSP:* "In general, do you think that a rise in the world's temperature caused by climate change is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?

2.4.2 Willingness to pay to address climate change

The Pew Global Attitudes Project asked respondents in 2009 and 2010 if they agree or disagree that "people should be willing to pay higher prices in order to address global climate change". This question measures intended behavior. In 2009, 52 percent agreed with this statement, while 40 percent disagreed in the 25 countries. And in 2010, 48 percent agreed and 43 percent disagreed in 22 countries. This cross-national descriptive finding should be far more worrying to climate change activists, as people seem reluctant to back-up their concern about climate change with a statement of action. Far more respondents are willing to say climate change is serious than state they are willing to sacrifice economically, even if "higher prices" is not specified.

2.4.3 Strength of concern about climate change

So far, I have shown that global public opinion on climate change is mixed: people express a high level of concern, but are divided over whether to sacrifice economically. This section adds to the mixed portrayal by looking at the strength of concern about climate change. I find more evidence those overwhelming majorities who say climate change is serious or dangerous provides a misleading picture of public opinion. Compared to risk perception of other environmental problems, climate change risk perception is not as impressive. Small minorities express that the environment is their most important issue and/or climate change their most important environmental problem. So even though people around the world express a high level of concern in abstract, for most, climate change does not seem to be an important issue.

First, although the skewed distribution of concern about climate change seems to show that the world is concerned, this finding is viewed in a vacuum. It is not compared to concern about other environmental problems. Both the WVS and ISSP asked respondents about their perceived seriousness or dangerousness of other environmental problems, including the various forms of pollution. Specifically, the WVS, in addition to asking respondents about "global warming or the greenhouse effect", also asked about the seriousness of the "loss of plant or animal species or biodiversity" and "pollution of rivers, lakes, and oceans" for the world as a whole. I measure mean perceived seriousness for these three questions on a range from zero ("not serious at all") to one ("very serious"). For all three environmental issues, mean perceived seriousness is very similar. Mean perceived seriousness is higher for climate change than it is "loss of plant or animal species or biodiversity", yet mean perceived seriousness for climate change is lower than it was for "pollution of rivers, lakes, and oceans". Specifically, mean perceived seriousness is 0.82 for climate change, compared with 0.80 for "loss of plant or animal species or biodiversity" and 0.86 for "pollution of rivers, lakes, and oceans." Although respondents in the 44 included countries are similarly concerned about all three environmental problems, they see water pollution as slightly more serious than climate change.[8]

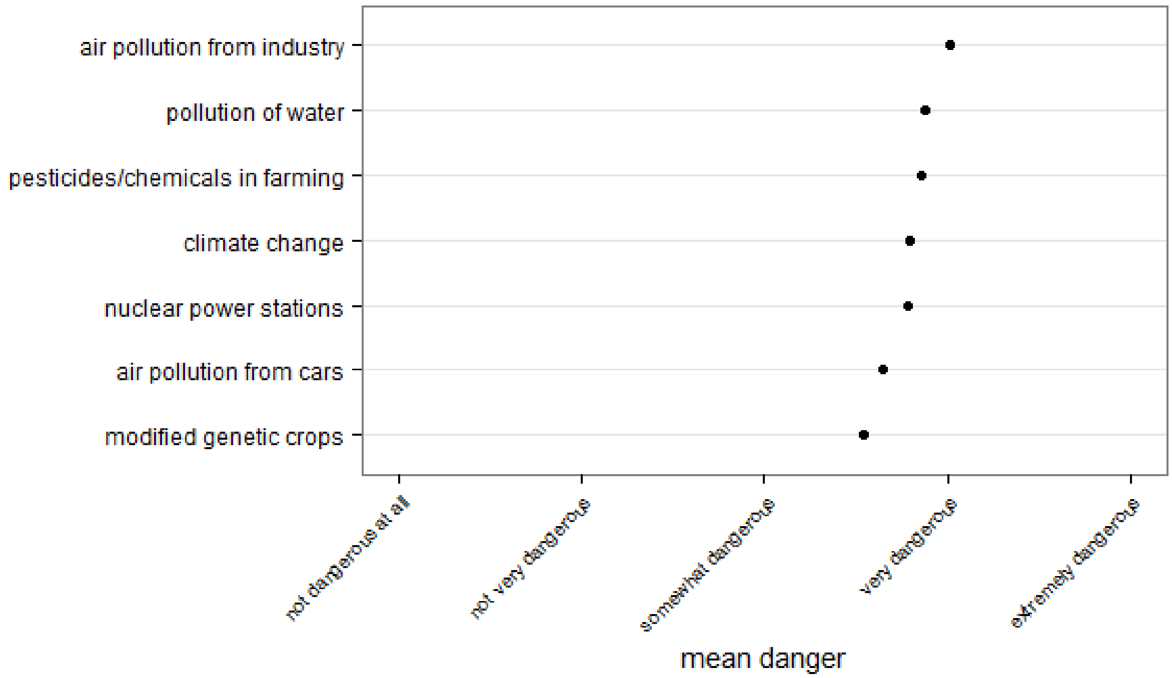
The ISSP asked respondents in 32 countries about the perceived dangerousness of seven possible environmental problems, providing a more detailed picture of global public opinion on concern about environment problems than the WVS. Figure 2.2 shows mean perceived dangerousness, ranging from zero ("not dangerous at all") to one ("extremely dangerous").[9] Of the seven environmental problems, climate change has the fourth highest mean perceived dangerousness value. Publics in these countries express a high level of concern about all seven problems, with the mean values between "somewhat dangerous" and "very dangerous". But, individuals in these countries consider "pesticides and chemicals used in farming", "pollution of the country's rivers, lakes, and streams", and "air pollution caused by industry" slightly more dangerous than climate change. Like the WVS, citizens in these countries are

[8] On the zero-to-one scale, response categories received the following values for the calculation of the mean: 0 – not serious at all; 0.33 – not very serious; 0.67 – somewhat serious; 1.0 – very serious.

[9] On the zero-to-one scale, response categories received the following values for the calculation of the mean: 0 – not dangerous at all for the environment; 0.25 – not very dangerous; 0.50 – somewhat dangerous; 0.75 – very dangerous; 1.0 – extremely dangerous.

once again more concerned about water pollution than climate change. By comparing perceived dangerousness of climate change to perceived dangerousness of other environmental problems in dozens of countries, climate change does not stand out.

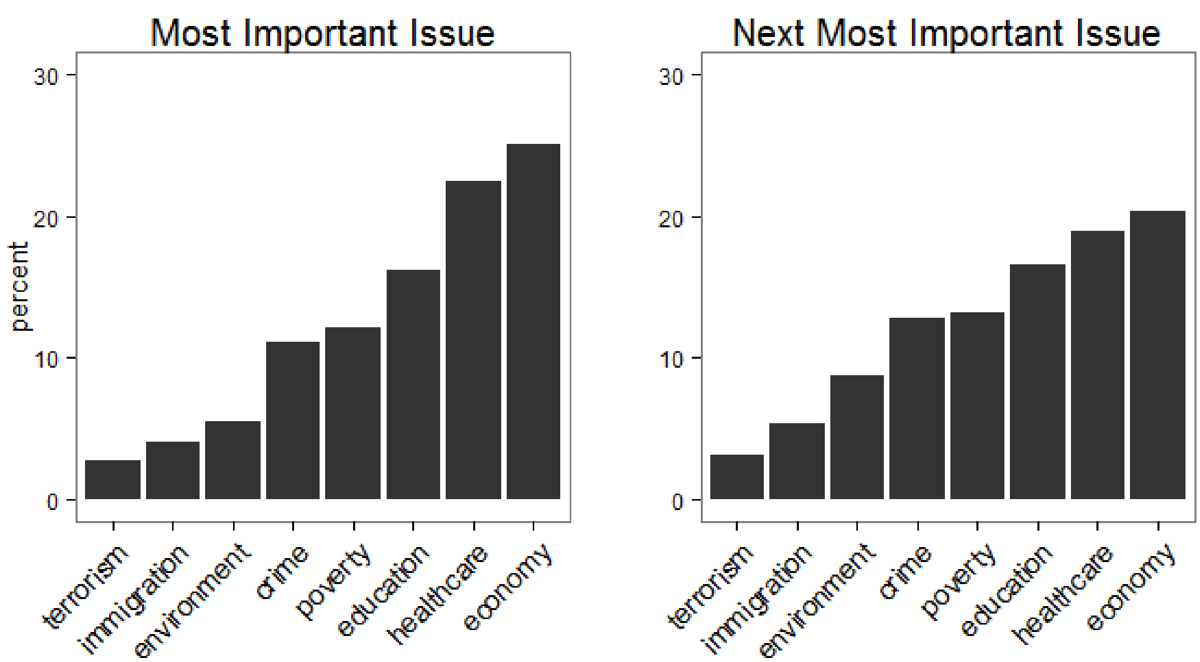
Figure 2.2: Mean perceived dangerousness across environmental problems in all countries (International Social Survey Programme 2009-2011**)**



Questions: *International Social Science Survey 2010:* In general, do you think that “air pollution caused by cars”; “air pollution caused by industry”, “pesticides and chemicals used in farming”; pollution of country’s rivers, lakes, and streams”; “modifying the genes of certain crops”; “nuclear power stations” is “not dangerous at all”; “not very dangerous”; “somewhat dangerous”; “very dangerous”; or “extremely dangerous for the environment”. The response categories received the following values for the calculation of the mean: 0 – not dangerous at all for the environment; 0.25 – not very dangerous; 0.50 – somewhat dangerous; 0.75 – very dangerous; 1.0 – extremely dangerous.

These small differences in means across make it difficult to determine what environmental problem is most important to citizens; citizens seemed to think that all environmental problems are dangerous and serious. To better understand what environmental issues are considered more important, respondents need to be asked to rank the importance of both general policy and specific environmental issues, rather than asking about the seriousness and dangerousness of each issue separately. The ISSP forced respondents to name the most important issues and problems their country and family face. This requires respondents to identify their most important issue or issues, rather than expressing concern about every issue and problem. First, ISSP asked respondents what general issue was the most important for their country today—health care, education, crime, the environment, immigration, the economy, terrorism, or poverty. Figure 2.3 shows the distribution of responses for both the most important and second most important issues. The global public seems divided on the most pressing issue. The modal response across countries is the economy. The environment ranks sixth out of the eight issues. Only about five percent of respondents say that the environment is the most important issue facing their country, compared with the one-in-four who mention the economy, 22 percent for health care, and 16 percent for education. When respondents were asked for their second most important issue, nine percent say the environment. This is once again a far smaller percentage than those who answer health care (20 percent), education (18 percent), and the economy (16 percent). Only about 14 percent of citizens in these 32 countries rank the environment as one of their two most important issues.

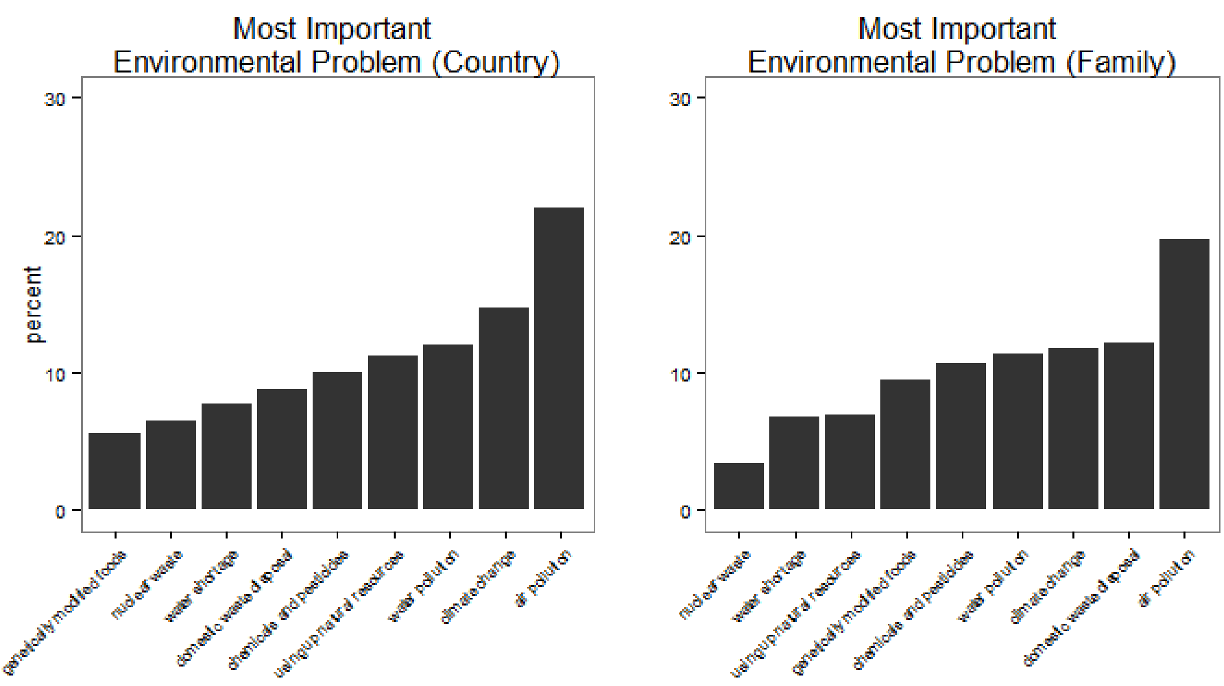
Figure 2.3: Most important issues facing country in all countries (International Social Survey Programme 2009-2011)



Questions: *International Social Science Programme 2010*: "Which of these issues is most important for [country] today?" "Which is the next most important?" The remainder of respondents answered "don't know" or another response category not included in the figure.

In the realm of specific environmental problems, how important is climate change? ISSP also asked respondents which environmental problem, from a list of nine, is the most important for their country and their family. Figure 2.4 shows the cross-national distribution on these two questions. These results provide further evidence that publics care more about pollution than climate change. Twenty-two percent choose air pollution as the most important environmental problem facing their country, compared with 15 percent for climate change. Fewer individuals choose both air pollution and climate change as the most important issue facing their family, but more consider still air pollution (20 percent) than climate change (12 percent) to be the most important problem. There is not a consensus in these 32 countries as to what is the most important environmental problem.

Figure 2.4: Most important environmental problem in all countries (International Social Survey Programme 2009-2011)



Questions: *International Social Science Survey Programme*: “Which problem, if any, do you think is most important for [COUNTRY] as a whole?” “Which problem, if any, affects you and your family the most?” Response categories “none of these” and “can’t choose” are excluded from the graph.

As can be seen, publics around the world seem to be sending a mixed message to policymakers on climate change. In isolation, citizens around the world express great concern about climate change, but compared to other environmental problems, their level of perceived seriousness or dangerousness is very similar. And the global public is more concerned about various forms of pollution than climate change. Moreover, few people care so much about the environment that they rank it as their first or second most important issues. For many around the world, climate change is a soft public policy problem, an issue that is not as important as other big public policy problems, such as health care and the economy, or even pollution. While many may be concerned about climate change, substantially fewer are alarmed.

2.5 Describing public opinion on climate change across countries

So far, I have focused on global public opinion, describing the distribution of responses to survey questions across dozens of countries, intentionally masking differences in mass public opinion between countries. This section describes these differences between countries, making two important conclusions. First, there is great variation in mass public opinion on climate change on all the above questions, risk perception, willingness to pay, and importance, between countries. Second, the United States—compared to similarly democratic and developed countries—stands out as an outlier on climate change and the environment.

2.5.1 Climate change risk perception across countries

First, I look at mean perceived seriousness of climate change for each country for the four Pew Global Attitudes surveys from 2007 to 2010. This variable ranges from zero (not a problem) to one (very serious), so increasing value reflects increased perceived seriousness. Figure 2.5 shows the mean perceived seriousness for each country, showing that important variation at the country-level in level of seriousness. In 2007, the public in Jordan expresses the lowest level of perceived seriousness in all four surveys, with a mean of 0.64, while the public in Brazil expresses the highest level of perceived seriousness, with a mean of 0.95. Brazil has the highest mean seriousness level in all four surveys.[10] Of the 37 countries included in 2007, the United States ranks 34rd in its mean seriousness, ahead of only Russia, Egypt, and Jordan, three countries with societies with little in common with the U.S. In 2008, the

[10] In the 2007-2009 Pew Global Attitudes surveys , Brazil's sample was disproportionally urban, so rural areas were less represented, and therefore the sample should not be considered representative of the Brazil's adult population. In the 2010 Pew Global Attitudes survey, Brazil's sample was representative of the adult population.

public in China expresses the lowest level of concern, with a mean of 0.69, and China is the only country with a lower mean than the United States. In 2009, the United States has the lowest mean concern of 0.69, behind China, Russia, Indonesia, Kenya, and Jordan. In 2010, Pakistan is the only country with a lower mean than the United States.

Figure 2.5: Mean perceived seriousness, by country, Pew (Pew Global Attitudes 2007-2010)

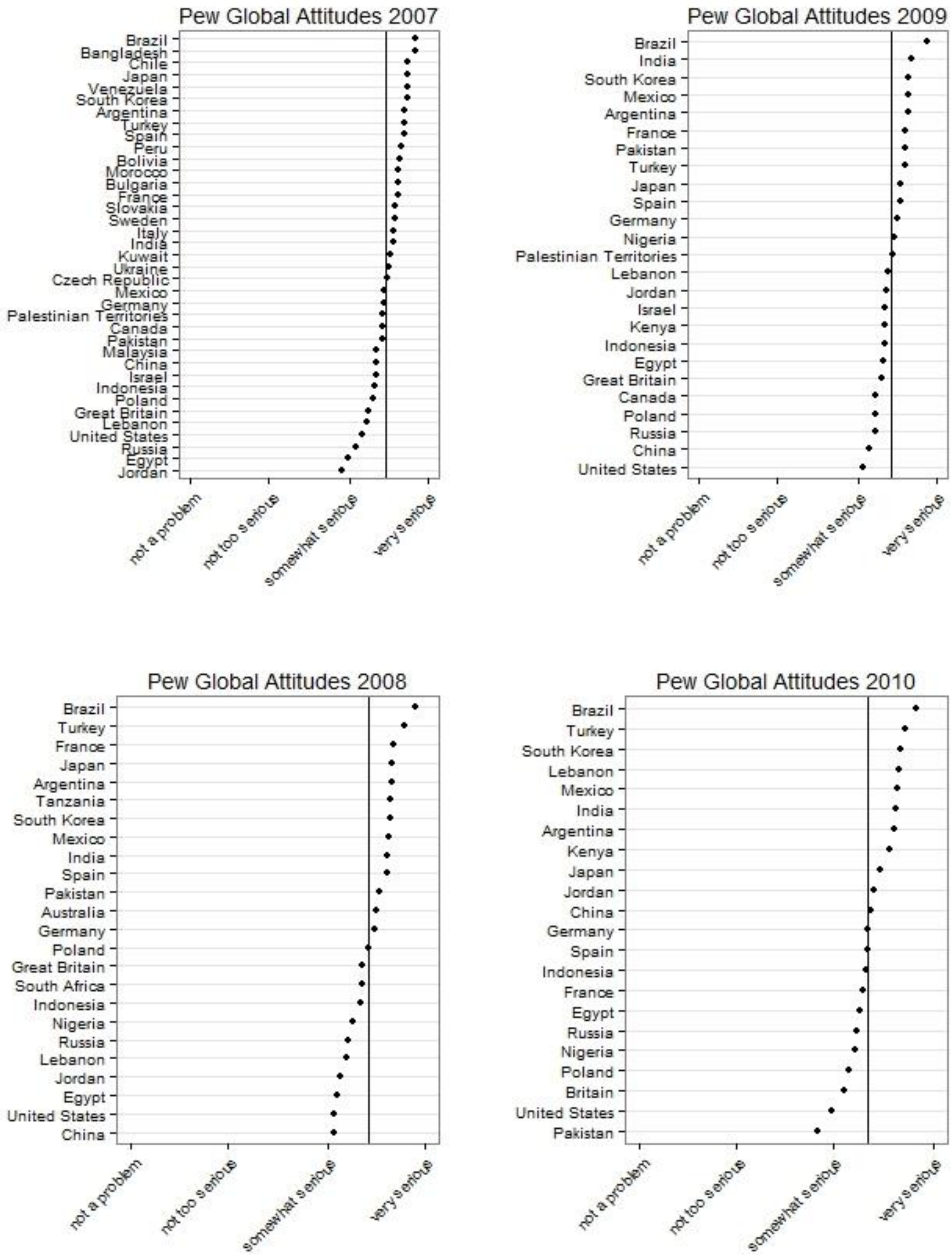


Figure 2.5 (cont'd)
Questions: *Pew Global Attitudes 2007, 2008, 2009*: "On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?" *Pew Global Attitudes 2010:* ""On another topic, in your view is global climate change a very serious problem, somewhat serious, not too serious, or not a problem?" On the zero-to-one scale, response categories received the following values for the calculation of the mean: 0 – not a problem; 0.33 – not too serious; 0.67 – somewhat serious; 1.0 – very serious. The vertical solid line represents the overall mean seriousness in all countries.

The four Pew Global Attitudes surveys show varying levels of seriousness between countries. Does this pattern hold for the World Values Survey? The mean seriousness for each country is shown in Figure 2.6. The variable once again ranges from zero (not serious at all) to one (very serious). And like the Pew Global Attitudes surveys, there is considerable variation between countries. Zambia has the lowest mean of 0.63, while Turkey has the highest of 0.95, reflecting the wide variation between mass publics in level of perceived seriousness of climate change. Here, the United States ranks 37th in mean seriousness, in between South African and Indonesia.

Figure 2.6: Mean perceived seriousness, by country, World Values Survey (World Values Survey 2005-2009)

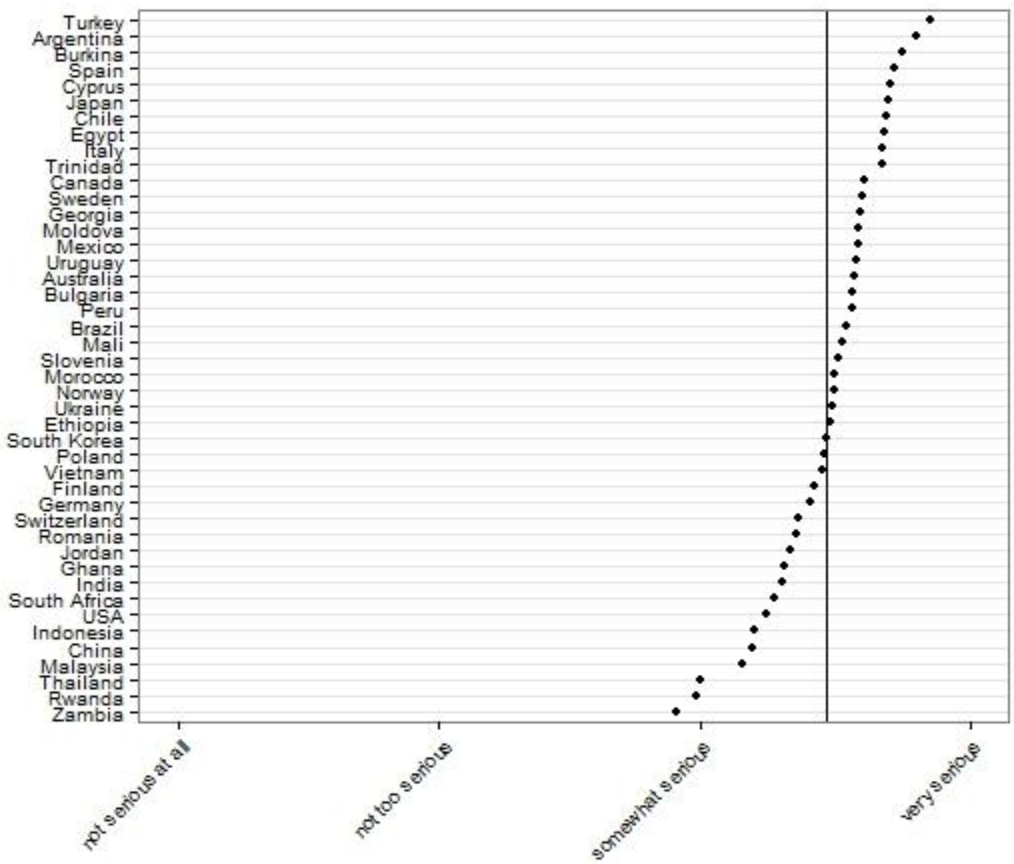
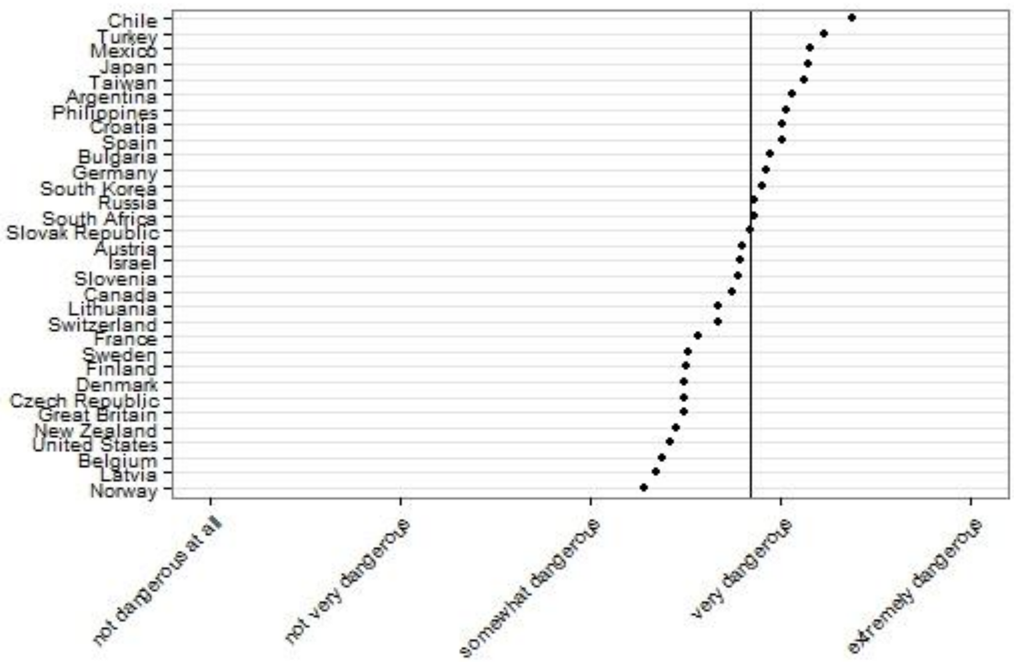


Figure 2.6 continued - Question: *WVS:* "Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or the greenhouse effect". On the zero-to-one scale, response categories received the following values for the calculation of the mean: 0 – not serious at all; 0.33 – not very serious; 0.67 – somewhat serious; 1.0 – very serious. The vertical line represents the overall mean.

The ISSP descriptive results, even with differences in question wording, shown in Figure 2.7, reinforce that there is important variation in climate change risk perception and concern in the United States is comparatively low. Like above, this variable ranges from zero (not dangerous at all) to one (extremely dangerous). Norway has the lowest mean of 0.57, while Chile has the highest mean of 0.87. Out of the 32 countries, the United States ranks 29th in mean perceived dangerousness, ahead of the Latvia, Belgium, and the aforementioned Norway.

Figure 2.7: Mean perceived dangerousness, by country, International Social Survey Programme (International Social Survey Programme 2009-2011)



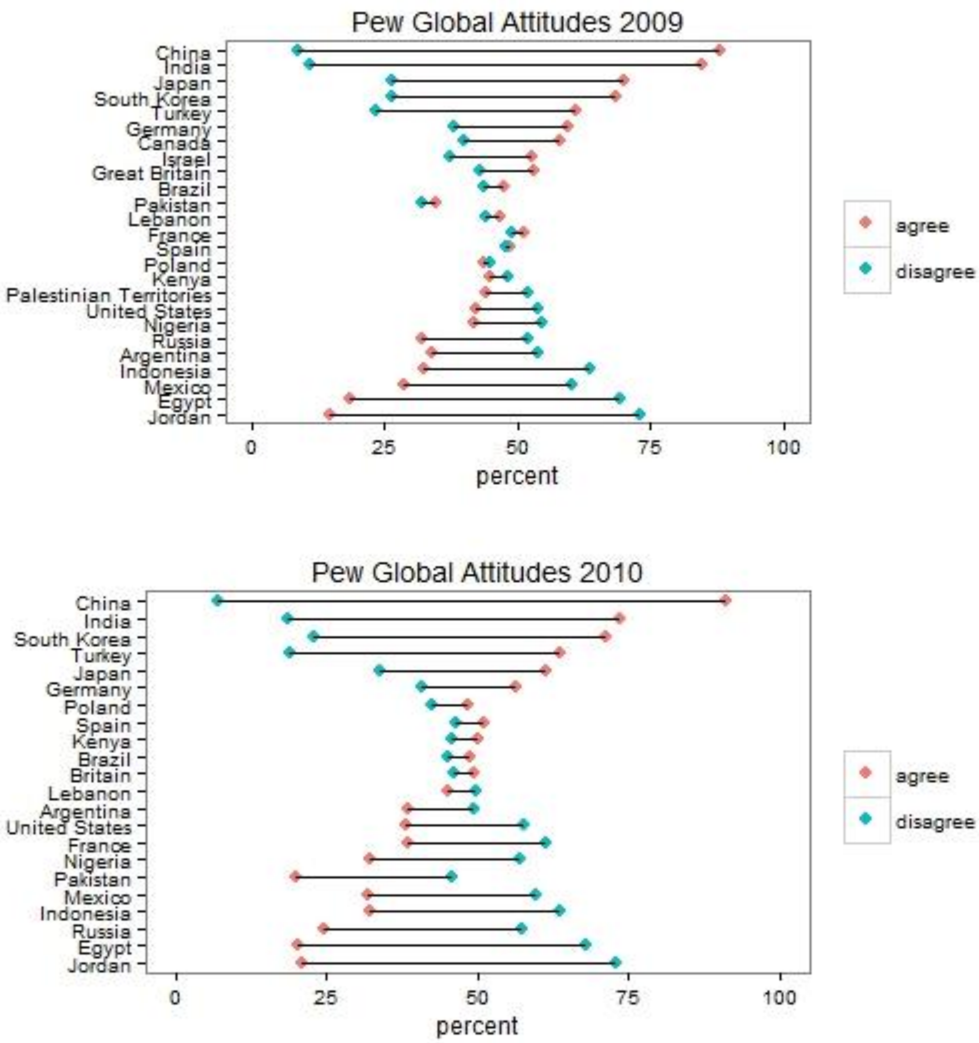
Question: *ISSP:* "In general, do you think that a rise in the world's temperature caused by climate change is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment? The response categories received the following values for the calculation of the mean: 0 – not dangerous at all for the environment; 0.25 – not very dangerous; 0.50 – somewhat dangerous; 0.75 – very dangerous; 1.0 – extremely dangerous. The vertical line represents the overall mean.

2.5.2 Willingness to pay to address climate change across countries

Next, I turn my attention to variation between countries in stated willingness to pay. Figure 2.8 shows the percentage in each country that agreed and disagreed that "people should be willing to pay higher prices in order to address global climate change" and the difference between these two percentages, represented by the line. So the longer the line, the greater the difference between the percentage who agreed and disagreed in each country. The variation between countries is stark in both the 2009 and 2010 survey, as evidenced by the distribution of responses in Jordan and China. In both surveys, Jordanians and Chinese have dramatically different answers to this question. For the 2009 survey, 14 percent agree, while 72 percent disagree in Jordan; this compares to 88 percent agree and eight percent disagree in China. For the 2010 survey, 21 percent agree and 73 percent disagree in Jordan; 91 percent agree and 6 percent disagree in China.[11] In both the 2009 and 2010 surveys, more disagree than agree in 11 countries, including the United States. In the United States, in 2009, 41 percent agree and 55 percent disagree that people should be willing to pay higher prices to address climate change. And in 2010, 39 percent of Americans agree and 61 percent disagree. So this question shows that when citizens are asked to make a statement of action on climate change, publics in these countries are far more divided than when they are simply asked about how serious or dangerous they consider climate change. And a majority of Americans are unwilling to sacrifice economically to help address the possible dangerous consequences of climate change.

[11] In both surveys China's sample was not nationally representative, as it mainly represented urban areas. So this sample should not be used to make conclusions about the entire country. More than likely, if I had access to a national sample, the difference between agree and disagree would be much smaller.

Figure 2.8: Willingness to pay to address climate change, by country (Pew Global Attitudes 2009-2010)



Question: *Pew Global Attitudes Survey 2009 and 2010:* "Please tell me whether you agree or disagree with the following statement. People should be willing to pay higher prices in order to address global climate change?" The remainder of respondents answered "don't know" or refused to answer the question, explaining why the percentages do not add up to 100. The line segment represents the difference between agree and disagree.

2.5.3 Strength of concern about climate change across countries

This section compares strength of concern between countries. Like the previous section looking at cross-national strength of concern in all countries, this section first compares climate change risk perception to risk perception of other environmental problems. Across countries, individuals express a similar amount of concern over environmental problems, including climate change. On the WVS, mean perceived seriousness of water pollution, climate change, and biodiversity is clustered between 0.67 ("somewhat serious") and 1 ("very serious") in 44 countries. Mean perceived dangerousness of all seven environmental problems in the ISSP generally is clustered between 0.5 (somewhat dangerous) and 0.75 (very dangerous) in 32 countries, as shown in Figure 2.9. This makes the seemingly high concern about climate change across countries and surveys seem less impressive, as many respondents call all possible environmental problems, from climate change to pollution to nuclear power, as serious and dangerous. Climate change risk perception does not stand out compared with other environmental problems.[12]

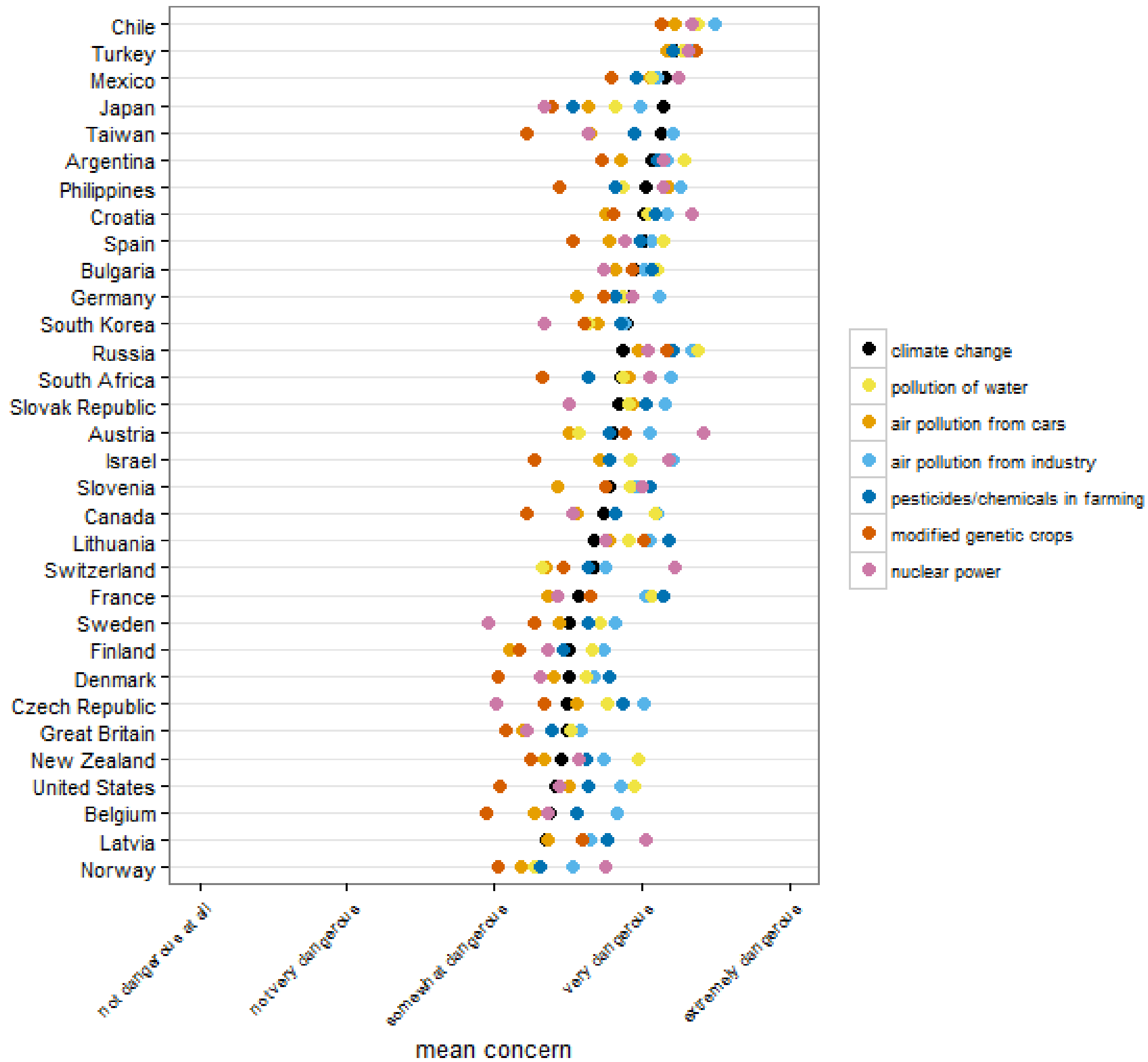
Second, publics around the world consider pollution more dangerous and serious than climate change. In thirty-three of 44 countries in the WVS, mean perceived seriousness of "pollution of rivers, lakes, and oceans" is the highest of the three included environmental problems. Climate change ranks first, ahead of water pollution, in only 10 countries. In another 15 countries, including the United States, climate change ranks last with the lowest mean perceived seriousness, behind both water pollution and the loss of species/biodiversity. On the ISSP survey, in only two countries—Japan and South Korea—is the mean perceived dangerousness value for climate change greater than the six other environmental problems.[13] Publics are at least slightly more worried about four other issues. Air pollution from industry had the highest mean perceived dangerousness in 12 countries, nuclear power in seven countries, pollution of water in six countries, and pesticides and chemicals in farming in five countries. In the United States, the dangerousness of climate change ranks sixth out of the seven problems, only ahead of genetically modified foods. The American public considers various forms of pollution to be more dangerous than climate change. By comparing climate change risk perception to risk perception of other environmental issues, the seemingly high level of concern in the United States and around the world is

[12] For example, look at Chile and Turkey, the two countries with the highest mean concern about climate change in the ISSP survey. Chileans had the highest concern about air pollution from industry (0.87) and lowest concern about genetically modified crops (0.78). Turks were most concerned about genetically modified crops (0.84) and least concerned about air pollution from cars (0.79). In both countries, concern about climate change ranked in the middle, and the means for all seven environmental problems were clustered together at the high end of the range. In these countries, publics were generally expressed that all the included environmental problems were dangerous; they did not consider climate change to be particularly dangerous.

[13] In three countries—Chile, Mexico, and Taiwan—mean concern about climate change was the second highest.

not unique. In most countries, publics considered other environmental problems, including pollution, to be more dangerous.

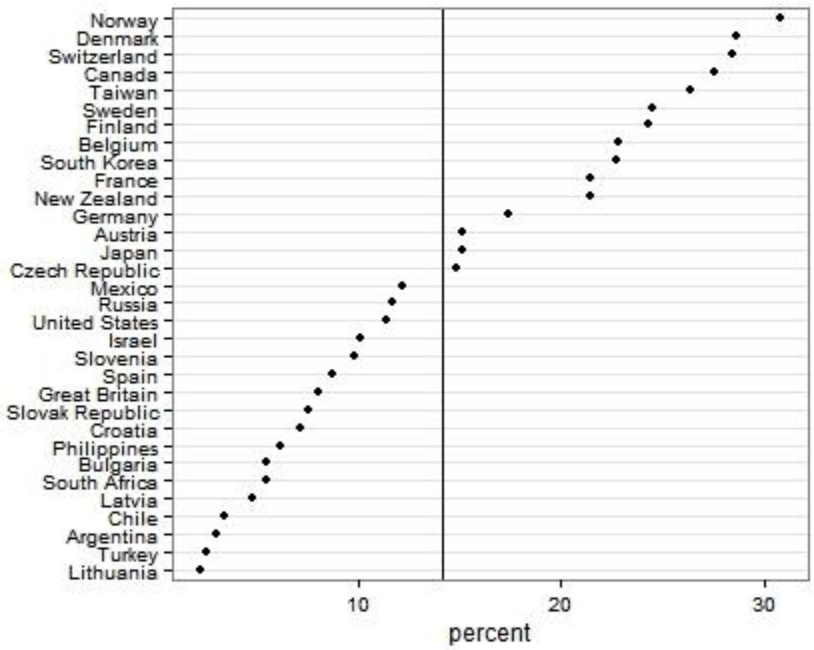
Figure 2.9: Mean perceived dangerousness about environmental problems, by country (International Social Survey Programme 2009-2011)



Questions: *International Social Science Survey 2010:* In general, do you think that "air pollution caused by cars"; "air pollution caused by industry", "pesticides and chemicals used in farming"; pollution of country's rivers, lakes, and streams"; "modifying the genes of certain crops"; "nuclear power stations" is "not dangerous at all"; "not very dangerous"; "somewhat dangerous"; "very dangerous"; or "extremely dangerous for the environment". The response categories received the following values for the calculation of the mean: 0 – not dangerous at all for the environment; 0.25 – not very dangerous; 0.50 – somewhat dangerous; 0.75 – very dangerous; 1.0 – extremely dangerous. The legend shows how the colors correspond with specific environmental problems.

Finally, I look at the percentage in each country who considers the environment to be a most important issue and climate change to be the most important environmental problem. There is considerable variation across countries in the size of the group of citizens who consider the environment and climate change more important than other issues and problems. When forced to make a choice only a small minority of respondents rank the environment and climate change as an important priorities. Figure 2.10 shows the percentage of citizens in each country who considered the environment to be the most or next most important issue facing their country in the ISSP survey. Thirty-one percent of Norwegians call the environment either most important or second most important issue, the highest percentage of all 32 countries. The countries with the highest percentage of citizens to consider the environment one of their most important issues are mostly in Europe. Twenty-nine percent of Danes, 28 percent of Swiss, 25 percent of Swedes, 24 percent of Fins, 23 percent of Belgians, and 21 percent of French name the environment. The United States ranks 15th out of 32 countries, with about 11 percent of Americans naming the environment as one of their two most important issues. This was below the mean across all countries of 14 percent, but Americans are slightly more likely than the British (8 percent) to consider the environment an important issue.

Figure 2.10: Environment as most important or next most important issue, by country (International Social Science Programme 2009-2011)



Questions: *International Social Science Programme 2010*: "Which of these issues is most important for [country] today?" "Which is the next most important?" Percentage in each country that chose the environment as the response category for either question.

Figure 2.11 shows the percentage of citizens in each country who consider climate change the most important environmental problem for their country, compared to the three mostly commonly chosen environmental problems in all countries—"air pollution", "water pollution", and "using up our natural resources". Immediately, the large percentage of Japanese who name climate change as their country's most important problem jumps out. Fifty-two percent of Japanese adults consider climate change the most important environment problem. And Japanese are far more likely than citizens from any other country to name climate change. The five next most likely, and seven out of eight, are in countries in Europe. In Norway, Germany, Denmark, Spain, and Austria, about one-in-four name climate change as their country's most important environmental problem; and in Great Britain and Finland, about one-in-five name climate change.[14] This provides more evidence that European publics are the most concerned about

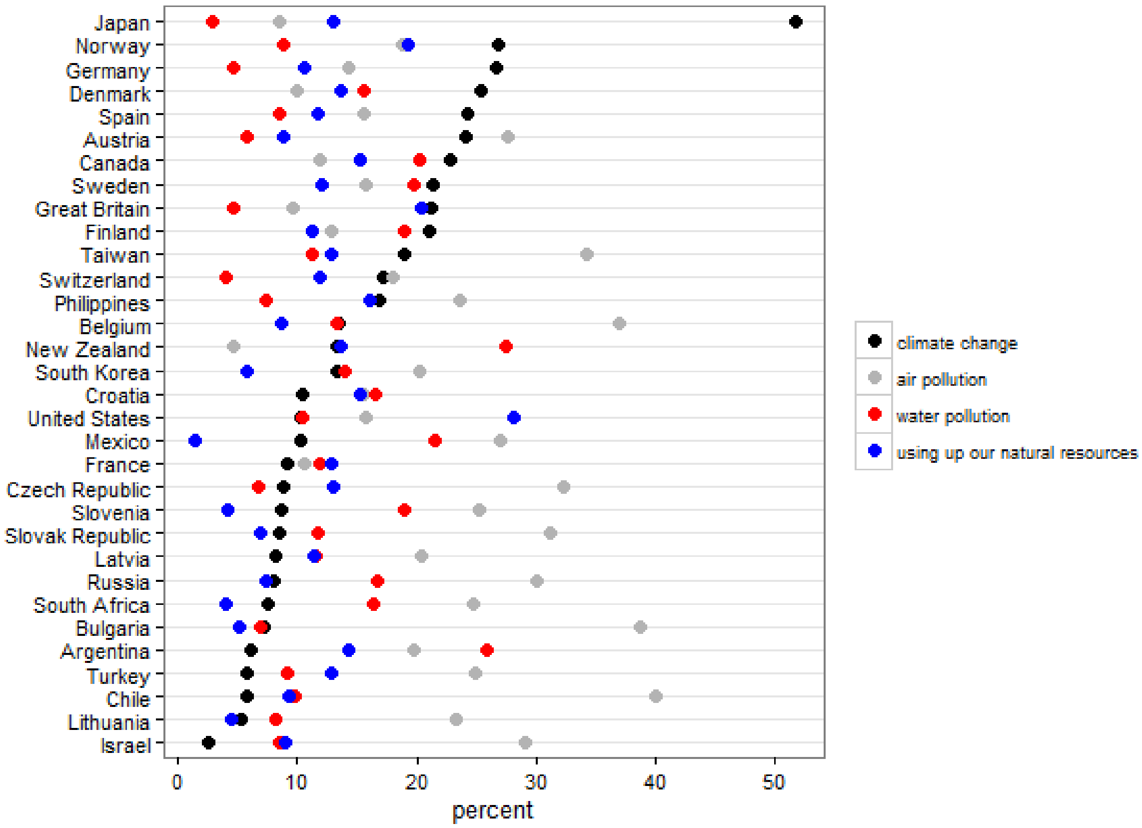
[14] Canada (21 percent) is the only non-European country other than Japan in which at least 20 percent call climate change their county's most important problem.

climate change because they more likely than non-Europeans to call climate change their country's most important environmental problem. Only 10 percent of Americans consider climate change to be the United States most important environmental problem, which ranked 14th.

By comparing across environmental issues, in most countries, I provide further evidence that publics in these countries consider air pollution more important than climate change. In nine countries of the 32 countries, climate change is the modal response when respondents are asked for their country's most important environmental problem. In 20 countries, a clear majority, air pollution is the most mentioned issue. And in 19 countries at least one-in-five respondents call air pollution their country's most important environmental problem. The U.S. stand outs because it is one of only two countries in which "using up our natural resources" is the most common response. Twenty-eight percent of Americans name "using up natural resources" as the most important environmental problem. The U.S. also stands out because it is one of only two countries in which climate change is the least common among the four popularly mentioned problems.[15]

[15] France is the other country.

Figure 2.11: Most important environmental problems, by country (International Social Survey Programme 2009-2011)



Question: *International Social Science Survey Programme*: "Which problem, if any, do you think is most important for [COUNTRY] as a whole?"

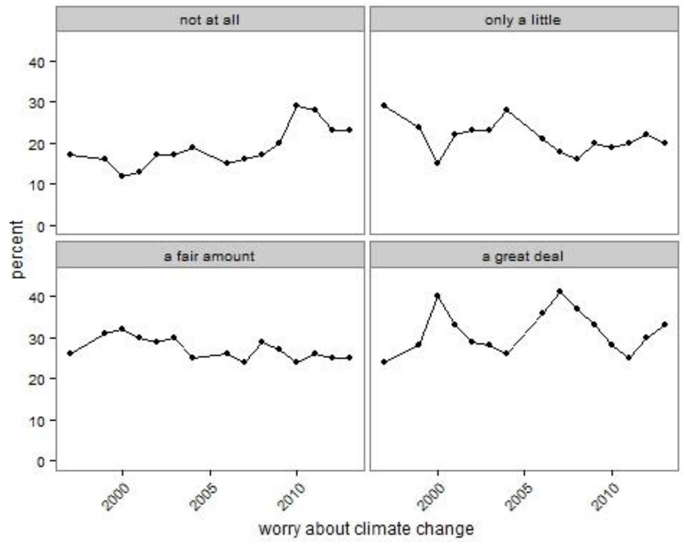
2.6 Change in climate change risk perception over time across countries

So far, I have focused on describing public opinion on climate change across and between countries. Due to the increased interest in public opinion on climate change, public opinion on climate change can also be described across time within countries. How has climate change risk perception in the United States and around the world changed over time? Public opinion surveys in the United States have shown that the public considers climate change less risky than it did previously; fewer Americans are worried and consider it a serious problem (McCright and Dunlap 2011, Scruggs and Benegal 2012, Guber 2013). Figure 2.12 shows the level of worry in the United States about climate change from 1997 to 2013, with response categories ranging from "not at all" to a "great deal", using survey data from the Gallup

Organization.[16] Although there are year-to-year fluctuations in worry between 1997 and 2007, the American public becomes slightly more worried about climate change. Then from 2007 to 2011 the public became much less worried about climate change. There is a meaningful decrease in the percentage of Americans who worry “a great deal” about climate change between 2007 and 2011. In 2007, 41 percent of Americans worry “a great deal” about climate change; by 2011, only 25 percent worry “a great deal”. Similarly, the percentage of Americans who worry “not at all” about climate change increases in this same period. In 2007, only 16 percent of Americans are “not at all” worried; by 2011, 29 percent of Americans are “not at all” worried.

[16] Gallup asks respondents about their worry about environmental issues, including climate change every year from 1997 to 2013, except 1998 and 2005. Obtained from the Roper Center on Public Opinion.

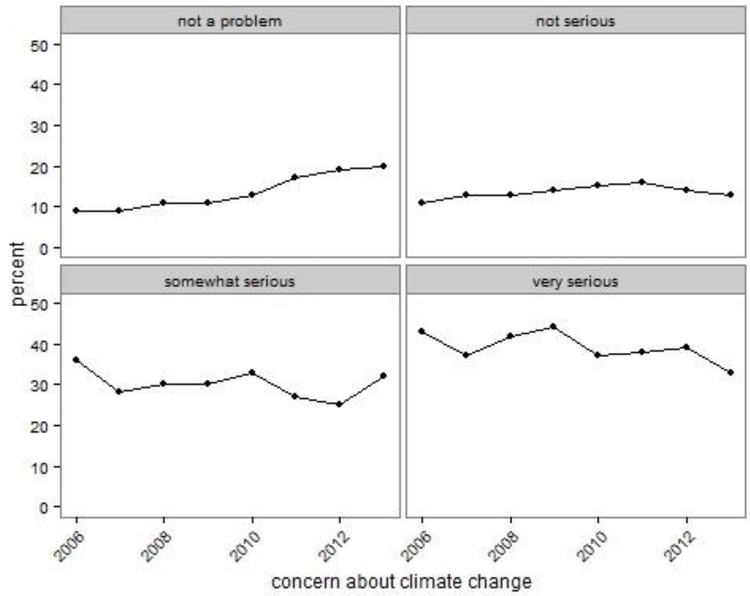
Figure 2.12: Perceived worry about climate change in the United States, 1997-2013 (Gallup Organization)



Gallup: "I'm going to read a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. How much do you personally worry about global warming?"

Pew Research Center also asked Americans about how serious they consider climate change every year from 2006 to 2013, documenting the same decline in concern as the Gallup surveys. In 2007, 47 percent of Americans view climate change as a "very serious problem" and nine percent consider it "not a problem". By 2013, only 33 percent of Americans view climate change as a "very serious problem", while 20 percent consider it "not a problem". Unlike Gallup, which found a slight increase in worry in 2012 and 2013, Pew documents a continued decrease in perceived seriousness of climate change over those two years.

Figure 2.13: Perceived seriousness of climate change in the United States, 2006-2013 (Pew Research Center)



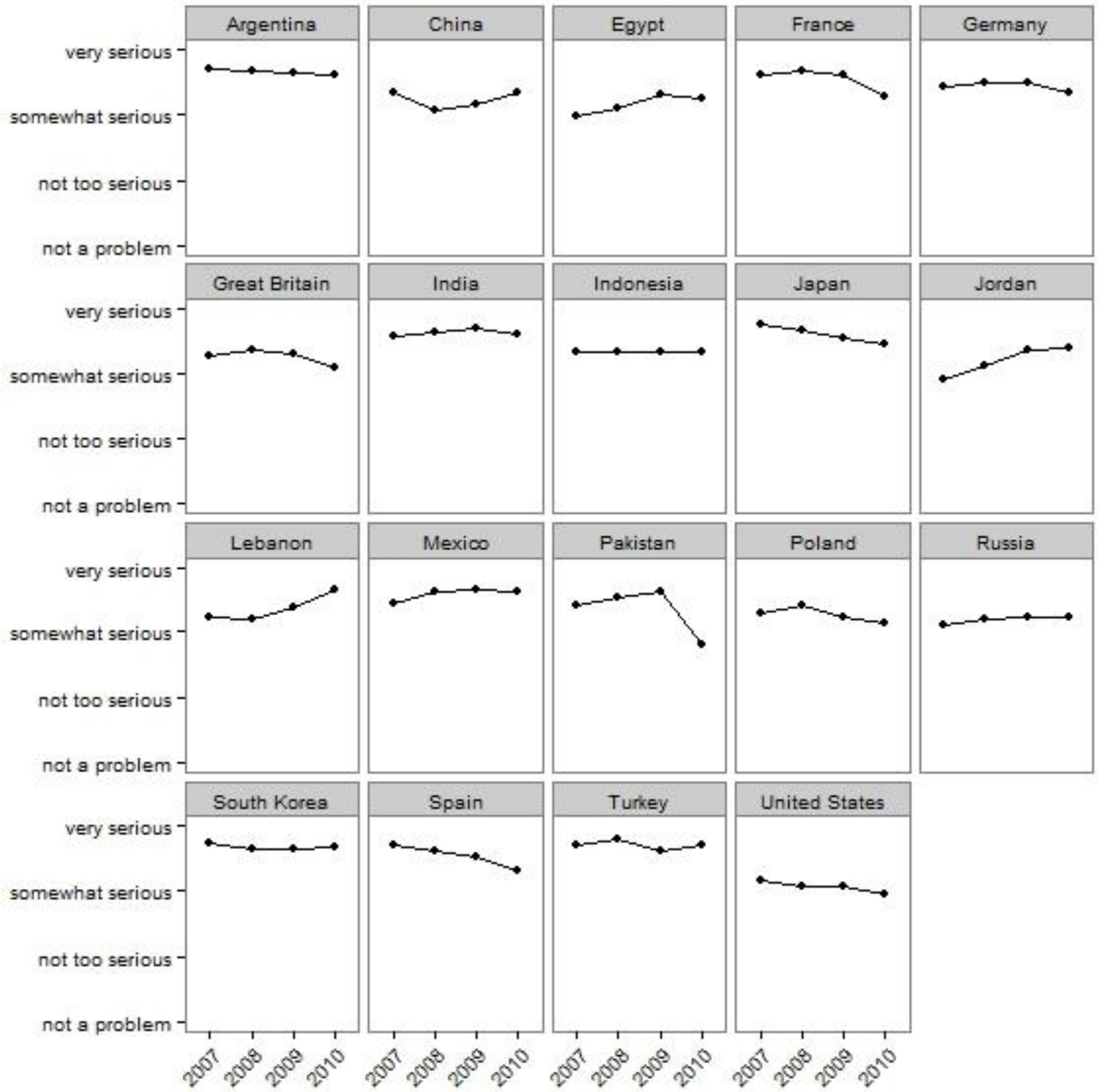
Notes: Question: "In your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?

Is the United States unique in its declining concern about climate change, captured by two different survey organizations, in recent years? Although the United States stands out for its low level of concern compared to similar and neighboring countries, its decline in concern during this time period is common. Pew includes 19 countries in all four Global Attitudes surveys from 2007 to 2010, a period of great decline in perceived seriousness and worry about climate change in the United States. Figure 2.14 shows mean perceived seriousness in these 19 countries from 2007 to 2010 on the zero-to-one range used previously, with increasing values reflecting increased perceived seriousness.[17] In 12 of the 19 countries, including the United States, mean perceived seriousness declines over this time period. The United States has the fifth greatest decline, between Japan and Great Britain. Mean perceived seriousness also decreases in Spain, France, Germany, and South Korea. So the decline in concern about climate change at the end of

[17] It is important to note that the wording of this question changed in 2010. In 2007-2009, the Pew Global Attitudes Project asked respondents about the seriousness of "global warming", while in 2010, Pew Global Attitudes Project asked respondents about the seriousness of "global climate change". So any changes between 2009 and 2010 could be the result of the change in question wording. Between 2007 and 2009, mean perceived seriousness declined in 9 out of 19 countries, including the United States. Mean seriousness declines by a greater amount between 2007 and 2009 in Japan, China, Spain, and Turkey than in the United States though.

the last decade is not uniquely American; it occurred among publics in many other wealthy countries, possibly driven by the global recession.[18]

Figure 2.14: Mean perceived seriousness of climate change, by country, 2007-2010 (Pew Global Attitudes Surveys 2007-2010)



Questions: *Pew Global Attitudes 2007, 2008, 2009*: "On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?" *Pew Global Attitudes 2010:* ""On another

[18] The percentage of citizens in France and Japan who view climate change as a very serious problem decreases by even more than in the United States. The percentage of Americans who view climate change as "very serious" decreases by 10 percent (from 47 to 37 percent) from 2007 to 2010. The percentage of respondents in France and Japan, however, who view climate change as "very serious" decreases by 20 percent (from 68 to 48 percent in France and from 78 to 58 percent in Japan).

Figure 2.14 (cont'd)
topic, in your view is global climate change a very serious problem, somewhat serious, not too serious, or not a problem?" On the zero-to-one scale, response categories received the following values for the calculation of the mean: 0 – not a problem; 0.33 – not too serious; 0.67 – somewhat serious; 1.0 – very serious.

2.7 Discussion and conclusion

This chapter provides a detailed description, capturing a variety of aspects of cross-national public opinion on climate change by using six cross-national surveys and additional survey data from the United States. It demonstrated three important conclusions. First, although most people around the world say climate change is serious and dangerous, this worry about climate change is weak. In general, people around the world consider all environmental problems to be serious or dangerous. And people in most countries are more concerned about the forms of pollution than about climate change. So climate change continues to not be a "front-burning issue" around the world. Second, American public opinion on climate change is unique. Across all six surveys, Americans are less concerned and more divided about climate change other wealthy countries. And on the other questions, which capture willingness to sacrifice economically to address climate change and considering the environment and climate change important issues, the United States lags behind similarly wealthy countries. Third, the decline in concern about climate change in the United States at the end of the last decade is not unique though. The perceived seriousness of climate change declines during this time period in many other similar countries, such as Great Britain, France, and Japan.

This chapter shows that researchers need to rely on a variety of survey questions across countries to understand cross-national public opinion on climate change. Simply relying on one question, such as risk perception, might lead a researcher to overstate how much publics are concerned about climate change. By using multiple questions across surveys, this chapter portrays cross-national public opinion on climate change as complex. This chapter also shows that simply describing public opinion about climate change in one country without situating it in the comparative context could be misleading. By describing public opinion in the United States compared to other countries, I show that U.S. public is less worried about climate change than other countries. The remaining chapters in this project shift the focus to explanation.

Chapter 3: Previous explanations for climate change and environmental risk perceptions

3.1 Introduction

The previous chapter described opinions and attitudes on climate change cross-nationally. So far, though, I have not attempted to explain climate change opinions and attitudes. This chapter shifts the focus from description to explanation by discussing theoretical explanations and empirical findings from previous research on public opinion on climate change and the environment. It organizes this interdisciplinary work, drawing from sociology and psychology, in addition to political science, on public opinion on climate change and the environment, focusing on the United States and cross-nationally.[1] For two decades, scholars have had vigorous disagreements about the relationship between individual and country characteristics with environmental concern. Scholars have debated both what factors matter and how they matter in explaining public opinion on environmental issues.

What are the most important differences in previous research? First, previous research has not come to a consensus as to what direction individual and country affluence influences opinions on climate change and the environment. Some scholars argue that individual and country affluence increase concern about climate change and the environment, while others argue individual and country wealth has no effect or even a negative effect. Second, some scholars argue that religiosity increases concern, while others argue for the opposite effect. Third, scholars also do not agree as to why the relationship between left-right political orientation and environmental/climate change attitudes in the United States is so strong and if this relationship extends cross-nationally. Some argue this wide difference between the left and right is the result of economic positions, others hold that psychological orientation explain the difference, while a different group of scholars contend that elite opinion is what matters. Fourth, scholars disagree on the impact of education and environment on climate change and environmental concern. Some argue that education should have a positive, additive effect on concern about these issues, as increasing education

[1] The discussion comes mostly from the literature on environmental concern as theories explaining public opinion on climate change are still nascent.

and knowledge makes people more aware of the dangers of climate change and environmental degradation, while others argue that the influence of education is conditioned by political orientation, as more educated and knowledgeable individuals are more likely to turn to elites and engage in motivated reasoning to align and protect their strongly-held political beliefs. I explain the theoretical approaches in detail below. At the end of this chapter, I also introduce data sources and methodological approaches used in the remaining chapters to analyze cross-national public opinion on climate change.

3.2 Individual wealth and post-materialism

Prevailing wisdom holds that protecting and enjoying the environment is a luxury good only available to rich people and rich countries (Baumol and Oates 1979, Dunlap and York 2008). For poor people, basic needs, such as food and shelter, take precedence over concern for the environment. According to this conventional wisdom, it makes logical sense that there is a causal connection between individual and national wealth and environmental concern; as affluence increases, so should environmental concern. The causal mechanism linking level of wealth and environmental attitudes has been informed by two similar theories: the well-known post-materialism theory (Inglehart 1977, 1990, Abramson and Inglehart 1995, Inglehart 1995, Inglehart and Baker 2000) and less-known affluence hypothesis (Diekmann and Franzen 1999, Franzen 2003, Franzen and Meyer 2010). In the first theoretical approach, the connection between wealth and environment attitudes is indirect; an increase in affluence (along with generational shifts) leads to changes in fundamental values, which then results in greater environmental concern. In the second theoretical approach—the affluence hypothesis—the connection is direct; an increase in wealth directly causes greater environmental concern, with the intermediate step of values changes unnecessary.

3.2.1 Post-materialism theory

Inglehart (1977, 1990, 1997) argues that the fundamental value change resulting from increased wealth and opportunity drives people to become increasingly concerned about the environment and supportive of environmental protection. Specifically, the shift from materialist values, emphasizing survivalist needs like food, water, and shelter, to post-materialist values, focusing on rights such as freedom of speech, explains why wealthier individuals are more likely than poorer individuals to become environmentalists. The primary assumption is that individuals place primary importance on meeting their physical needs—their most basic needs for survival (Maslow 1954). In most pre-World War II societies, most people were not meeting these most basic needs. Food and shelter were scarce. After World War II, most of Europe and the United States experienced an economic boom, so these survivalist goods were not as scarce. Most individuals had their economic and physical security needs met. With this increased affluence, individuals began to put greater emphasis on issues of rights and self-expression, including the environment. Inglehart (1977, 1990) argues that the adoption of these post-material values by many individuals in the developed world had profound consequences. These post-materialists became increasingly interested in their quality of life, such as the state of the environment, resulting in environmental movements in the United States and much of Europe (Inglehart and Baker 2000). So, for individuals, post-materialism theory posits that a rise in wealth leads to the adoption of postmaterial values, which then results in increased support for environmental protection.

Post-materialism theory was largely unchallenged until the early 1990s. Then a large number of environmental groups from developing nations participated in the 1992 Global Forum in Rio de Janeiro (Fisher 1993). And, in 1993, Gallup's *Health of the Planet* survey finds evidence that citizens of developing and developed countries both express worry about the environment. The publics of developing countries actually seem more concerned than the publics of developed countries (Dunlap, et al. 1993). The level of concern for the environment in the developing world was much higher than post-materialism theory predicted (Dunlap and Mertig 1995).

Proponents of post-materialism theory (Abramson and Inglehart 1995, Inglehart 1995, Abramson 1997) responded to the challenges of the early and mid-1990s by focusing on environmental conditions. Inglehart (1995) argues that mass public support for environmental protection is high in countries with major environmental problems. Countries with these environmental problems are usually so poor that they did not possess the resources to respond. So people in the developing world are often directly confronted with local environmental problems, such as stifling pollution and smog, raising their level of concern about the environment. In addition, in countries scoring high on his post-materialism index, he argues that more individuals have the resources to make financial sacrifices for the sake of environmental protection. These citizens of developed countries want to make the necessary financial sacrifices because concern for the environment aligns with their core values. So this explanation of environmental attitudes can account for high levels of concern in both developing and developed countries. Inglehart uses data from the 1990-1993 World Values survey to provide empirical support his revised theory. Inglehart and supporters of post-materialism theory have consistently found empirical support for the post-materialism theory (Inglehart 1990, Abramson and Inglehart 1995, Inglehart and Welzel 2005). For example, Kidd and Lee (1997), using the 1990-1993 WVS, also provide supportive empirical evidence, finding that individuals who are post-materialists are more likely to express concern about the environment than individuals who were materialists, regardless of the level of development of their country.

How could post-materialism explain opinions on climate change, a specific environmental problem, rather than just broad environmental concern? Although the connection between post-materialism and broader environmental concern has been hotly debated and tested empirically, the relationship between post-materialism and climate change attitudes is far less explored. Inglehart and Welzel (2005) provide a good theoretical starting point, situating environmental quality as a "new politics" issue. On these new politics issues, individuals with secular and self-expression values are more likely to see these topics as being about rights. And these rights must be expanded in order to protect and create self-expression, the fundamental post-material value. For example, gay rights need to be expanded in order to protect the self-expression values of gays; a particular group of people should not have their rights restricted. Climate change could be considered new politics issues, because mitigating the consequences of climate change helps keep the world in a condition all can enjoy. Climate change is also clearly an environmental protection issue. Mitigating the consequences of climate change is crucial for maintaining the quality of the environment. Therefore, according to post-materialism theory, I should expect a positive relationship between post-material values and climate change risk perception.

3.2.2 The affluence hypothesis

The affluence hypothesis, which posits that the relationship between individual wealth and concern about the environment is direct, is based on a simple assumption: there is a trade-off between economic interest and protecting the environment. Environmental quality is a public good in which citizens of a country have to contribute to maintaining, yet citizens also have an incentive to free-ride to not contribute (Diekmann and Franzen 1999). The primary driver of determining if and how much citizens contribute is their level of wealth. Assume that the cost of protecting the environment is fixed. Therefore, as individuals become richer, the relative cost of protecting the environment lowers (protecting the environment costs a smaller share of an individual's wealth). So, rich individuals are more likely to be able to afford to sacrifice in order to protect the environment, and for poor individuals, cost of environmental protection is just too great. Other immediate survivalist needs take precedent (Gelissen 2007). Franzen (2003: 199), the primary proponent of the affluence hypothesis, summarizes this rational choice argument nicely:

> Standard economic reasoning suggest that the protection of the environment is not only a public good, but also a normal good, whose demand increases with income. Citizens in wealthier countries not only have a higher demand for a clean environment, but they also have less pressing economic problems and are therefore more willing and able to reduce their standard of living in order to devote more resources to global environmental protection.

Several studies have found confirmatory evidence of for the affluence hypothesis, showing expected positive relationship between national affluence and environmental concern (Diekmann and Franzen 1999, Franzen 2003, Kemmelmeier, et al. 2002, Franzen and Meyer 2010, Franzen and Vogl 2013, Kemmelmeier, et al. 2002). And in addition, these studies, using International Social Survey Programme (ISSP) cross-national survey data from the 1990, 2000, and 2009-2010 waves, find the as individual affluence increases, so does concern for the environment.

Climate change is an environmental problem which could fit nicely into the affluence hypothesis framework. Maintaining the climate so all can enjoy it is a public good. Implementing climate change mitigation policies could be extremely costly, as mitigation policies could require both massive national and international investments and changes in individual lifestyle. Everyone needs to contribute by limiting and decreasing carbon emissions, yet everyone only receive the benefits of this sacrifice if mostly all contribute. Since there is such a strong incentive to defect and not sacrifice, the ability to make economic sacrifices should be important. Therefore, rich people and countries could be more willing to pay the associated costs and make the necessary sacrifices to maintain the climate. For poor people, the relative cost of all implementing climate change mitigation policies is more prohibitive, thus there is likely to less concern about climate change.

3.2.3 Alternative explanation

A number of scholars argue that affluence and post-materialism do not impact environmental attitudes. Instead, rich and poor individuals can both support environmental quality. Mass publics in both developing and developed countries worry about the environment; caring about the environment is a global phenomenon (Brechin and Kempton 1994, Dunlap and Mertig 1995). Rich and poor people and developing and developed countries are affected by poor environmental conditions. So everyone's experience with or perception of the environment should really matter in the formation of environmental attitudes. What drives experience with or perception of the environment? For many people, it is likely that local environmental quality plays a prominent role. And poor people seem more likely than rich people to experience harmful environmental conditions (Brulle and Pellow 2006). Rich people should be more able to shield themselves from local environmental degradation. For example, rich people are more able to move away for the pollution, smog, and other harmful environmental conditions of major cities in the developing world. According to this logic, poor people should be very motivated to care about the environment because environmental conditions have a greater impact on their lives. This motivation could help explain the many grassroots environmental organizations which formed in the developing world in the 1980s and early 1990s in response to harmful pollution (Dunlap and Mertig 1995).

Supporters of this alternative approach have found empirical evidence of no or even a negative relationship between post-materialism, affluence, and concern for the environment, providing support (Dunlap and Mertig 1995, Brechin 1999, Gelissen 2007, Dunlap and York 2008, Knight and Messer 2012). For example, Dunlap and York (2008), using three rounds of the WVS, found no relationship between post-materialism and concern about the environment. Supporters of the alternative approach are especially critical of post-materialism theory and the alternative approach. One group of scholars go as far as to call the search for a relationship between post-material values and environmental concern a "dead end" (Brechin, Mahai, and Simones 2005).

How does the logic of this alternative theoretical approach extend to climate change specifically? Individuals can experience the consequences of climate change in the long-term; rising sea levels, changing weather patterns, and droughts could have major consequences, depending on where people live. Rich people should be able to more readily adapt to these changes. For example, they can easily move and make changes to their property and lifestyle for safety to minimize the risks of climate change. Those who are poor cannot minimize the risk of climate change to the same degree. Thus, because rich people can more easily adapt than poor people to a changing climate, the poor could be more concerned about climate change than the rich. Therefore, the alternative approach predicts that there is no relationship or a negative relationship between individual wealth and risk perception. It would also predict a negative relationship at the country-level, as richer countries should be more able to adapt to the consequences of climate change. And finally it would predict no relationship or even a negative relationship between post-material values and risk perception.

3.3 Religiosity and religious identity

Like the impact of wealth and post-material values, the theoretical expectations and empirical evidence on the relationship between religion and both environmental concern and climate change risk perception is mixed. White (1967), in what become known as the White Thesis, offers the first prominent and important statement on the relationship between religion and environmental concern, arguing that Judeo-Christian values are inherently at odds with concern about the environment. She holds that

Christianity allows followers to separate their human experience from the experience of nature and the rest of the planet because humans have "dominion over the Earth". Followers face a conflict between humankind and nature, in which nature must be conquered and subdued. In addition, Christians should focus their effort and attention on the afterlife, rather than the condition of earth. White contends that according to religious teachings and values, Christians should not care about the environment. Ever since White offered this controversial argument, scholars have both debated the theoretical expectations and explored public opinion data to better understand the relationship between religiosity, religious identity, and environmental concern.

3.3.1 Supporting the White Thesis

Scholars have tested White's controversial argument that Christians are not concerned about the environment empirically, in both cross-national and single-country studies (usually focused on the United States). The empirical findings are mixed. Many scholars have found some evidence that Jews and Christians are less concerned about the environment than those who are not part of the Judeo-Christian religious tradition, both in the United States and cross-nationally (Greenly 1993, Schultz, et al. 2000, Biel and Nilsson 2005). But a host of other studies finds little support for the direct connection between religiosity and environmental concern. For example, Greenly (1993) finds in the United States a negative relationship between being Christian and environmental concern, yet a positive relationship between being Catholic and support for environmental spending. In another study, using a cross-national sample of undergraduates, Schultz and his coauthors (2000) propose that the direct effect of being Jewish or Christian on environmental concern might be weak and statistically insignificant when controlling for other important factors.

Since scholars struggle to find direct empirical evidence in support of the White Thesis, they have instead focus on exploring the impact of specific aspects of religiosity and religious identity. For example, some research shows a negative relationship between biblical literalism and environmental concern (Eckberg and Blocker 1989, Guth, et al. 1995, Schultz, et al. 2000). Individuals who interpret the Bible literally are less likely to worry about the environment than those who do not, although this finding is primarily based on studies from the United States.

How could the White Thesis, or the qualified White Thesis discussed in the previous paragraph, focusing on biblical literalism, help explain attitudes toward global warming? Barker and Bearce (2013) provide a more detailed theoretical explanation for the possible negative relationship between Christian religiosity and concern about climate change, focusing on Christian End-Times theology. Christian End-Times theology holds that environmental conditions on earth must rapidly deteriorate before the Second Coming of Christ. Therefore, the consequences of global warming could be seen as the environmental deterioration that must take place immediately before the Second Coming. In other words, for believers in End-Times theology, climate change and its consequences could actually not be a source of concern, but instead welcomed. Climate change could be a sign that Christ is returning soon. And belief in End-Times theology is especially prevalent among fundamentalist and evangelical Christians in the United States. Using public opinion survey data from the United States, Barker and Bearce find that belief in the Second Coming is associated with a lack of support for government action to combat global warming. Specifically, belief in the Second Coming is predicted to decrease the probability of supporting government action on climate change by more than 10 percentage points. Other scholars also find supportive evidence of a relationship between Christian conservatism and evangelism and climate change attitudes in the United States. Wood and Vedlitz (2007) find a negative relationship between religious conservatism and concern for global warming. Smith and Leiserowitz (2013) find that American evangelicals are less likely to think climate change is happening, less likely to say climate change is caused by human activity, and less worried than American non-evangelicals. In the United States at least, there is supportive evidence that both religiosity and religious identity influences attitudes on climate change.

3.3.2 Opposing the White Thesis

Other scholars offer different arguments opposing the White Thesis. Religiosity could have a positive relationship with environment concern, and Christians could be more likely to care about the environment. For example, Christians might believe in protecting the environment because for them the Earth is God's creation, providing a theoretical explanation for a possible positive relationship. Or religiosity and religious identity are not just important for explaining environmental concern; there are other factors that better explanation variation in environmental concern in the United States and cross-nationally. For example, Kanagy and Willits (1993), using survey data from the U.S. state of Pennsylvania, find a positive relationship between religious service attendance and behavior in support of the environment. Moreover, the White Thesis and its empirical support might also be specific to the United States. Religiosity and religious identity might have a different influence, both in direction and strength, on environmental and climate change attitudes, depending on context. Most empirical work on the relationship between religiosity and environmental concern uses survey data from only the United States. Compared to other wealthy countries, the United States has a large percentage of evangelical Christians and conservative Christians, which makes it a unique case.

3.4 Left-right political orientation

Scholars of public opinion in the United States have long emphasized the important role left-right political orientation, as measured by self-described political ideology and partisanship, plays in the way Americans make sense of the political world (Campbell, et al. 1960). In the United States, political ideology and partisanship are not only closely related to vote choice, but they also exert influence over a host of issue positions and attitudes.[2] Perhaps no policy area has illustrated this ideological and partisan polarization in the United States than the environment. Scholars highlight the important influence of ideology and partisanship on environmental attitudes in the United States (Dunlap and Gale 1974, Buttel and Flinn 1978, Pierce and Lovrich Jr 1980, Van Liere and Dunlap 1980, Jones and Dunlap 1992,

[2] Democrats and Republicans have been shown to be divided over domestic policy (Layman and Carsey 2002, Layman, et al. 2006, Bafumi and Shapiro 2009) and even on questions of foreign policy (Berinsky 2009). And political ideology in the United States has a strong influence on issue attitude in a number of policy areas, as liberal and conservatives have been shown to be divided on issues including welfare (Gilens 2000), racial issues (Sniderman, et al. 1984), and government spending (Jacoby 2000, Jacoby 2008).

Dunlap, et al. 2001).[3] Liberals and Democrats are more likely to be concerned about the environment and support action to protect it than conservatives and Republicans (Dunlap, et al. 2001). Unsurprisingly, more recent research shows this relationship with views on the environment extends to views on climate change, including belief in climate change, risk perception, and support for mitigation policies (McCright and Dunlap 2011, Egan and Mullin 2012, Guber 2013, Krosnick and MacInnis 2013). This research shows that liberals and Democrats are more likely to be concerned about climate change, believe it is caused by human activity, and support mitigation policies than conservatives and Republicans.

Why would left-right political orientation have a strong influence on climate change risk perceptions? One of the more prominent explanations argues that climate change attitudes could be closely tied to economic attitudes (McCright and Dunlap 2011). Action to combat climate change requires both increased economic costs and direct government action. This necessary response is deeply ideological, as it supports fundamental liberal policy ideas and rejects conservative ones. Conservative economic ideology holds a fervent belief in the power of unrestricted free markets. To guarantee free markets, conservatives typically support individual freedom, the protection of property rights, and small government. Liberals, on the other hand, hold that free markets lead to inefficient, unequal outcomes. With this notion of conservative and liberal economic ideology, broad environmental protection is government regulation of markets to protect the environment, a public good. After all, environmental quality something all individuals can enjoy. Liberals do not believe that the market can protect the environment, because a firm in the free market has an incentive act in a way that benefits the firm but hurts environmental quality.

But this explanation for the relationship between left-right political orientation and climate change opinions is context specific to many wealthy countries in which left-right political orientation is

[3] Although while scholars found evidence of the strong relationship between political ideology and concern for the environment, they showed the relationship between partisanship and concern for the environment was much weaker. Pierce and Lovrich (1980) argued that this weak finding was because the environment was not a prominent issue tied to partisan issue agendas. More recently, partisanship has been to have a much stronger influence on environmental concern than previously thought (Dunlap, et al. 2001), showing that environmental attitudes are more closely tied to partisanship.

closely tied to economic ideology. In this context, left-right political orientation should be related to how people think about climate change. But in other contexts, left-right political orientation is not related to economic ideology. In these other places, cleavages such as ethnicity and religion might be important to shaping political identities, not left-right politics. Left-right political orientation should not be related to climate change opinions here. So there should be a great deal of variation across countries in the strength of the relationship between left-right political orientation and climate change attitudes if economic positions play a role in the explanation.

3.5 Education and engagement

Previous scholarship also has diverging expectations about the effect of education, knowledge and information on environmental concern. Science communicators sometimes hopefully assume a positive relationship between these factors and broad concern about the environment; as individuals becomes more educated, informed, and knowledgeable about environment (factors which should be closely related), individuals become more concerned about the environment. Other scholars criticize this approach as overly simplistic, contending that the effects of the education, information, and knowledge could be conditional. Two similar approaches, popular in political psychology, emphasize the effect of education, awareness, and knowledge is conditional on left-right political orientation, so the effect of these factors on climate change attitudes is not uniformly positive for the left and the right. One approach contends that educated and political aware individuals are more likely engage in motivated reasoning and so their beliefs and opinions stay in line with their broader political views (Lodge and Taber 2013). This approach lines up with system justification theory in pyschology (Feygina, et al. 2010), as those on the right engage in motivated reasoning to protect the status quo. A second, very similar, approach argues that political engaged individuals are more likely to be aware of and use elite cues in forming political opinions (Zaller 1992).

3.5.1 The deficit model

Scientific communicators often assume that if the mass public is presented with more factual information about a science issue, they better understand it and adopt the opinions and attitudes of scientific experts (Bauer, et al. 2007). So science communicators often emphasize increasing knowledge about science issues through media and educational programs, an approach known as the deficit model of science communication (Bauer, et al. 2007). In the case of climate change, science communicators would hope that increasing factual knowledge about climate change increases concern. For example, widely disseminating the fact that the earth is warming as a result of human behavior should lead to an increase in concern in climate change; individuals should consider climate change more serious or dangerous with this information. In this way, the deficit model assumes that people are informal Bayesian updaters: they update their prior belief based on their evaluation of the acquired new information. If the evaluation is positive, then the belief or opinion will be revised upward; if the evaluation is negative, then the belief or opinion is revised downward.

So the deficit model would predict a positive relationship between science knowledge and concern: as knowledge increases, concern about climate change should also increase. After all, additional information about climate change and its possible consequences, such as rising sea levels and more violent storms, should cause a rational individual to revise their level of concern about climate change upward. So, according to the deficit model, to increase public concern about climate change, more information and facts need to be released. In addition, education should increase public concern about climate change, as the better educated should be more aware of climate change facts and information.

3.5.2 Information processing and motivated reasoning

Some scholars of public opinion on climate change focus on how individuals interpret and process information, as climate change is an issue in which most individuals are exposed to new, complex information (Marquart-Pyatt, et al. 2011). Research in political psychology, which looks at how individuals process such information, finds that those on the right are more likely to engage in system justification motivation than those on the left (Jost, et al. 2003a, Jost, et al. 2003b, Jost, et al. 2008).[4]

[4] Systems justification theory is similar to dominant social paradigm theory. Individuals who subscribe to the dominant social paradigm have been found to less supportive of environmental protection than those who do not (Dunlap and Van Liere 1984).

Individuals with system justification tendencies are motivated by the desire to protect the status quo, which they find stable and secure. When faced with a threat to the current system, these individuals respond by becoming intensely protective of the current system, even if the current system threatens their well-being in the short and/or long-term. Climate change represents a clear threat to the current system.[5]

If those on the right find acknowledging climate change threatening because it changes the status quo, then they are likely to engage in motivated reasoning when processing new information on climate change. Work in social psychology indicates that individuals engage in motivated reasoning in all sorts of areas, including politics (Kunda 1987, 1990). When individuals process information about an issue such as climate change, they use a filter defined by predispositions. Prior beliefs serve as a powerful filter, so individuals engage in biased information processing that reinforces these prior beliefs (Wood and Vedlitz 2007). How is this related to system justification? When individuals are confronted with new information, like scientific information on climate change, those who refuse to change their opinions are protecting the status quo and engaging in system justification.

The predispositions that make up an individual's filter when confronting political information consist of at least an individual's background, values, and political ideology. Research in public opinion has shown political ideology has a strong influence on information processing, often biasing opinions and attitudes (Popkin 1991, Sniderman, et al. 1993). Political ideology is one powerful filter allowing people to more easily sort through new information. New information that supports the prior belief is accepted unchallenged and new information that challenges the prior belief is discarded. So new information is not evaluated rationally, and individuals will process new information differently based on their ideological filter. The consequence of this is that exposure to new information has a heterogeneous effect on individuals. From a non-experimental perspective, individuals with the same level of knowledge on climate change different opinions based on their political ideology (Hart and Nisbet 2012).

[5] As Feygina, Jost, and Goldsmith (2010: 328) write, "For many people, addressing and acknowledging environmental problems appears to be threatening to the very foundations of social, economic, and political status quo".

Citizens could be especially likely to engage in motivated reasoning on “hot” issues (Taber and Lodge 2006, Lodge and Taber 2013). And climate change certainly qualifies as a “hot” issue, at least in the United States. In order to engage in motivated reasoning on climate change attitudes and opinions, citizens need to have some information about climate change. In other words, citizens must be aware of the position they should take on climate change based on their broader political ideology and values. And then as an individual’s information level increases, therefore making them more aware of the ideological similarity or dissimilarity on this particular issue, the impact of the ideological perceptual screen should become stronger; individuals become more entrenched in the opinion. Motivated reasoning theory predicts that there is an interaction between engagement and political ideology in explaining concern about climate change. As an individual’s knowledge of climate change increases, they become more aware of how climate change attitudes align with their ideology. The positions of liberals and conservatives on climate change should diverge.

3.5.3 Elite cues

Motivated reasoning and information processing argues that people turn to their partisan and ideological predispositions generally. This greatly reduces the information costs for citizens to form opinions. But citizens have other possible avenues to lower the informational cost of forming opinions. Normal citizens simply do wish to invest in learning about complex issues like climate change, so turning citizens want to lower the information cost of forming an opinion (Downs 1957). Citizens also value consistency and hence align political attitudes and policy preferences to form a coherent belief system, even if they have difficulty forming such a consistent belief system (Converse 1964). Individuals can form consistent political opinions in the most efficient way possible by relying on shortcuts or cues (Lupia and McCubbins 1998). Scholars of public opinion in the United States have argued that the most important heuristics for opinion formation are partisanship and political ideology (Lodge and Hamill 1985, Rahn 1993).[6]

[6] There are other possible sources for heuristics on climate change. Individuals could use daily experiences from their own daily lives (Popkin 1991). For example, in forming their opinions on climate change, recent research has

By following an ideologically similar political elite, citizens allows their beliefs, opinions, and policy preferences to align with their broader political values. For example, an individual who self-identifies as a conservative would turn to a trusted conservative political elite or elites for an opinion on a certain issue, since their share the same political ideology, using the elite to decrease the informational costs associated with forming an opinion on politics. When asked a question on a political issue in a public opinion survey, citizens answer it by using the cue (Zaller 1992, Sniderman, et al. 1993). This allows citizens with little public policy knowledge and poorly developed political belief systems to hold consistent opinions and beliefs about politics. Scholars of public opinion in the United States have found that evidence that partisanship and political ideology serve as information shortcuts on many public policy issues (Zaller 1992, Levendusky 2009).

Many public opinion scholars would argue that climate change is an issue in which citizens are likely to turn to like-minded elites as a heuristic. Climate change is a complex scientific issue which most citizens are not directly involved with, so the information costs are high and desire to pay those

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shown that individuals use their daily experience with the weather. So, if an individual experiences a hotter summer than usual or a more violent storm than what is common, then the individual might be more likely to express belief that climate change is happening and concern about climate change. Of course, short-term weather variability is poor evidence of climate change, as the weather changes caused by climate change are slower, yet recent studies in the United States have found that this experience with local weather matters in public opinion on climate change. Krosnick and his colleagues (2006) find that respondents who think that local temperature has increased recently are more likely to accept that climate change is happening. Egan and Mullen (2012) look at the effect of objective weather conditions, coming to a similar finding: an increase in local temperature has a significant impact on climate change beliefs. Finally, Donner and McDaniels (2013) find that national temperature changes also affect climate change attitudes.

There is little evidence that individuals use scientists or experts to form opinions on climate change. Experts could be extremely useful on complex public policy issues requiring a lot of specialized knowledge and information. For example, even though individuals do not seem to use or value scientific information, they could still use the opinions of scientists as a heuristic in processing. After all, trusting the opinions of experts seems like a rational way to form opinions on an informational costly issue such as climate change. And there is a near scientific consensus that climate change is happening and dangerous. Yet, there is to be a disconnection between scientific experts on climate change and the mass public, at least in the United States (Zajko 2011). Public opinion surveys in the United States have shown that a majority of Americans do not believe that there is a scientific consensus on climate change. For example, the Yale Project on Climate Change Communication and George Mason University Center for Climate Change Communication have surveyed Americans since 2008 on whether respondent think that there is a scientific consensus that global warming is happening. In none of the nine national surveys have a majority of Americans said that most scientists think global warming is happening. At least in the United States, scientists do not communicate their findings on climate change in a way that the mass public can understand (Zajko 2011). Thus, there is a high threshold to citizens aligning their belief systems with the scientific findings.

information costs low.[7] So, on the particular issue of climate change, an individual who self-identifies as on the right would turn to the conservative elite for information, and an individual who self-identifies as on the left would turn to the liberal elite for information.

In order for political elites to influence mass opinion on a public policy issue, such as climate change, ideological and partisan elites must first take clear and divergent positions on a particular issue (Zaller 1992). If the left and right take the same position, then the vast majority of the public also take the same position. It is not enough, however, for elites to just take simply take divergent positions on ideology. These divergent positions then need to be broadcast. After all, citizens cannot follow like-minded elites if they do not know their position.

Even if political elites take a divergent position on an issue and broadcast their divergent position, elite opinion does not have a homogeneous effect on public opinion. Zaller (1992) argues that political awareness determines how citizens respond to elite messages. Politically aware citizens are more able to bring a cue in line with their political leanings. They are not learning directly from the cue, but they are more able to scrutinize the source to determine whether it fits with their ideology and party. Politically unaware people cannot do this because they are less likely to understand how the cue fits with their ideology and party. Therefore, political unaware citizens are more likely to accept an inconsistent cue, thus holding a position that does not align with their broader political ideology. And there is plenty of evidence that political awareness conditions the influence of political ideology and partisanship on climate change opinions in the United States. Recent research has shown in predicting opinions and attitudes on climate change, the influence of education (Hamilton 2008, Hamilton and Keim 2009, McCright 2011, McCright and Dunlap 2011) self-described scientific knowledge (Hamilton 2011), self-described knowledge about climate change (Malka, et al. 2009), assessed scientific knowledge (Hamilton, et al. 2012), and even income (Bohr 2014) were conditional on left-right political orientation.

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[7] Moreover, considering that the consequences of climate change are long-term and individuals discount tend to discount the future, which is an additional disincentive for citizens to seek information (Jacobs and Matthews 2012).

These empirical findings are powerful empirical evidence that educated and scientifically knowledgeable Americans engage in motivated reasoning or turn to political elites for cues. Sorting out the motivations is difficult with observational data only in the United States. It is not known if this conditional relationship between engagement and left-right political orientation extends to cross-national setting. And by comparing public opinion in the United States to public opinion in other countries, it is possible to test whether motivating reasoning or elite cue-taking best explain why Americans are so polarized on climate change.

Table 3.1 summarizes the different theoretical explanations for environment and climate change risk perception from this section.

Table 3.1: Theory and empirical expectations

Theoretical Perspective	*Concept*	*Expectation*
Post-materialism Theory	Post-materialism	Individuals with post-material values should be *more* concerned about climate change than those with material values.
Alternative Approach		Individuals with post-material values should be *equally* or *less* concerned about climate change than those with material values.
Affluence Hypothesis	Individual Wealth	Rich individuals should be more concerned about climate change than poor individuals.
Alternative Approach		Rich individuals should be *equally* or *less* concerned about climate change than poor individuals.
Affluence Hypothesis	Country Wealth/ Development	Citizens in rich and more developed countries should be *more* concerned about climate change than citizens in poorer and less developed countries.
Alternative Approach		Citizens in rich and more developed countries should be *equally* or *less* concerned about climate change than citizens in poorer and less developed countries.
Supporting the White Thesis	Religiosity	More religious individuals should be *less* concerned about climate change than less religious individuals.
Opposing the White Thesis		More religious individuals should be *equally* or *more* concerned about climate change than less religious individuals.
Supporting the White Thesis	Protestantism	Protestants should be *less* concerned about climate change than non-Protestants.
Opposing the White Thesis		Protestants should be *equally* or *more* concerned about climate change than non-Protestants.
Left-right political orientation	Self-described Political Ideology	Individuals on the left should be *more* concerned about climate change than individuals on the right.
Deficit Model of Science Communication	Education, Political Interest	More educated and politically interested individuals should be *more* concerned about climate change than less educated and politically interested individuals.
Motivated Reasoning Theory/Elite cues	Education, political interest, and environmental knowledge conditioned on political ideology	As an individual's level of education, political interest, the difference between the left and right in concern about climate change should *increase*.

3.6 Data

This project draws from numerous public opinion surveys to explain global public opinion, including both cross-national surveys (including many countries) and surveys conducted in the United States. Many of these surveys were used in the previous chapter to describe global public opinion on climate change. This section describes the different surveys, why they are used, and in what remaining chapters they are used. More detailed information on the data sources and measurement is available in Appendix A.

Five public opinion surveys are used in the remaining chapters. The largest cross-national survey used is the World Values Survey (WVS) third wave, conducted from 2005 to 2009, including countries from all regions and levels of development. The WVS asked respondents about climate change in 44 countries. The WVS is used throughout the four main empirical chapters. The next largest cross-national survey used is the International Social Survey Programme (ISSP), conducted in 32 countries mainly wealthy countries between 2009 and 2011. The ISSP included numerous questions on climate change and the environment. In addition to using it in Chapter 1, I also use it Chapter 7 to explore the relationship between attitudes on climate change and the environment. I also use the 2009 and 2010 Pew Global Attitudes study to explore the relationship between climate change risk perception and willingness to pay higher prices to address climate change in Chapter 7. Finally, I use the American National Election Studies from 2008 and 2012 to analyze the conditional relationship between political ideology and political knowledge on climate change attitudes in the United States in Chapter 6.

3.7 Methodological approach and estimation strategy

The analysis relies on a variety of different approaches to test the theoretical expectations and hypotheses. This section describes the statistical analysis, with is used throughout to analyze influence of individual-level and country-level characteristics.

3.7.1 Multilevel modeling

This project makes extensive use of multilevel modeling because survey respondents were nested within countries in the cross-national surveys. Random-intercept models are used to estimate the average effect of individual characteristics across countries. Random-intercept models are also used to explore the importance of context, in which country-level variation in climate change opinions are modeled as a function of important country-level characteristics, such as GDP per capita. Next, multilevel random-intercept, random-effect models are used to explore variation in the effect of individual-level characteristics across countries. Finally, multilevel cross-level interaction models are used to explore how the effect of independent variables across context. Multilevel modeling is explained in more detail below.

Standard linear and generalized linear models assume each observation is independent, but this assumption is problematic in situations in which individuals are clustered into groups, such as in cross-national public opinion surveys in which respondents are grouped within countries. If clustering is not accounted for in the modeling strategy, the parameter estimates and precision of the estimates can be biased.[8] In order to provide unbiased estimates the independent variables and also properly estimate uncertainty, the clustering of respondents in countries needs to be modeled. In other words, the model needs to account for the fact that individuals in different countries are exposed to different contextual effects. And these different contextual effects impact individual opinions and behavior.

There are two possible approaches for modeling clustering: fixed effects and the random-intercept model (often called random-effects) (Clark and Linzer 2013). To illustrate the different approaches, consider a standard regression model that does not account for clustering. Let *i* denote individuals and *j* denote the clusters/groups.

$$(1)\ \ y_i \sim N(\alpha_{j[i]} + \beta x_i, \sigma_y^2)$$

In order to account for the clustering, the intercept α_j must be allowed to vary between clusters. Fixed effects controls for the unexplained group-level variation through "group dummy variables" or including *j-1* group dummy variables in the model. This allows for each country to have its specific intercept. So the model looks as follows:

[8] This modeling approach is often called the pooling approach (Gelman and Hill 2006, Clark and Linzer 2013). There are situations in which the pooling approach produces unbiased estimates of the parameters. First, if the variation in the intercept estimate is just random noise that cannot be model. Or second, the not included variables in the model which predict the dependent variable are not correlated with the included variables. In practice, these situations almost never arise, so the pooled model is usually the incorrect approach when modeling clustered data.

$$(2)\ y_i \sim (\sum \alpha_i z_{j-1} + \beta x_i, \sigma_y^2)$$

This modeling strategy controls for country-level heterogeneity, which produces unbiased estimates of the average effects of the independent variables across countries. But these estimates may be inefficient because of the additional number of parameters included.

The random-intercept model is a compromise between pooling all the observations together and ignoring clustering and the fixed effects model (Gelman and Hill 2006). Here, the intercept is modeled by the normal distribution, defined by the overall/grand mean γ_{00} and the variance of the intercepts, σ_α^2.

$$(3)\ y_i \sim (\alpha_{j[i]} + \beta x_i, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00}, \sigma_\alpha^2)$$

Estimates for each α_j can be recovered from the model, although the distribution does shrink the estimates of α_j toward the grand mean, μ_α. The estimates of each intercept are closer to the grand overall mean than in the fixed effects model. The amount of shrinkage is determined by the variance between countries, σ_α^2.[9]

So, when using the random effects model, there is only one term in the model for the intercept, rather than *j – 1* parameters for the fixed effects model. This improves the efficiency of the estimates of the independent variables in the model. This increased efficiency comes with a trade-off of introducing possible bias into the estimates of the independent variables because the model does completely control for country-level heterogeneity. With the random-intercept model, since country-level variation is modeled, omitted variable bias could be a problem (Bafumi and Gelman 2006).

With random-intercept framework, the variation in the country-level intercepts can be modeled as a function of country-level characteristics. The importance of certain contextual factors can be tested in order to explain variation in the dependent variable, which is not captured by the individual-level

[9] The shrinkage of each estimated cluster intercept to the grand mean is the reason why the random effects model is considered a compromise. When $\alpha \to 0$, then there is complete pooling (as all cluster intercepts will be at the grand mean estimate. When $\alpha \to \infty$, then the grand mean has no effect, and there is no pooling (Gelman and Hill 2006). As Gelman and Hill (258) show, when $\alpha \to \infty$ the fixed effects and random effects models are equivalent. And as Clark and Linzer note, "the random effects specification models the intercepts as arising from a distribution with a finite—and estimable—variance, σ_α^2 , whereas the fixed effects specification assumes the intercepts are distribution with infinite variation.

independent variables. Equation 4 shows a multilevel model with one country-level covariate to explain variation in the country-specific intercepts. I use γ_{00} to denote the overall intercept and γ_{01} to denote the effect of country-level predictor. There are two disturbance terms: σ_α which captures the residual level-two, country-level variation which exists after controlling for $\gamma_{01,}$ and ε_i which captures the level-one residual variance after controlling for the level-one, individual-level predictor: $\beta_{ij.}$ Prediction error in the random-intercept model is the result of not perfectly modeling the response variable at the individual level and not perfectly modeling the country-level variation (Steenbergen and Jones 2002).

$$(4)\ y_i \sim N(\alpha_{j[i]} + \beta x_i, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00} + \gamma_{01} z_j, \sigma_\alpha^2)$$

This model can then be extended to accommodate multiple level-one and level-two predictors, as shown in Equation 5, where β_k is a vector of level-one predictors and γ_{0m} is a vector of level-two predictors. These are the equations used to estimate multilevel models predicted perceived seriousness of climate change using the WVS in the next chapter.

$$(5)\ y_i \sim N(\alpha_{j[i]} + \textstyle\sum_{k=1}^{k} \beta_k x_{ki}, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00} + \sum_{m=1}^{m} \gamma_{0m} z_j\, , \sigma_\alpha^2)$$

Multilevel models can be extended to allow the effect of an independent variable or variables to vary across countries. In the random-intercept models, the covariate effects are fixed or the same across countries. A researcher, however, might expect for the relationship between an individual characteristic and dependent variable to be different across countries. Models that allow for both country-specific intercepts and country-specific independent variable effects are called random-intercept, random-effect models. Equation 6 shows random-intercept, random-effect model specified with one individual-level covariate and no country-level covariates (Snjiders and Bosker 2012, Stegmueller 2013):

$$(6)\ y_i \sim (\alpha_{j[i]} + \beta_k x_{i[k]}, \sigma_y^2)$$

$$\begin{bmatrix} \alpha_k \\ \beta_k \end{bmatrix} \sim N\left(\begin{bmatrix} \gamma_{00} \\ \delta_{00} \end{bmatrix}, \Sigma\right)$$

The term δ_{00} represents the average effect of the independent variable across all countries. The country subscript of β_k shows that the independent variable has a different coefficient across countries, rather than being fixed, as it is in the random-intercept model. With the introduction of a random coefficient, the model has a more complicated variance structure. The random-intercept, random-coefficient model requires the estimation of three variance components: the variance of the intercept, the variance of the coefficient, and the covariance of the intercept and the coefficient. When estimating the statistical models with random effects in this project, I distinctly estimate the covariance, rather than setting the variance to zero, a strong assumption which nevertheless is available in estimating multilevel models in some statistical software packages. The variance-covariance matrix is as follows (Stegmueller 2013):

$$(7)\ \Sigma = \begin{bmatrix} \sigma_\alpha^2 & \sigma_\alpha\sigma_\beta \\ \sigma_\alpha\sigma_\beta & \sigma_\beta^2 \end{bmatrix}$$

By estimating a random-intercept, random-effect model, I can test to see if the variation in the effect of an important individual-level independent variable, such as left-right partisanship, is significant countries.

Then I can test to see if country-level context factors, such as wealth and development, explain the meaningful variation in the effect of the important individual-level variables. To explain this variation, I rely on cross-level interaction models (Snjiders and Bosker 2012). In these models, both the country-specific intercept and the effect of the individual-level variable vary across countries, and the variation in the effect of the individual-level variable is explained by a country-level variable. So the effect of the individual-level variable varies according to the country-level variable. In Chapters 5 and 7, I test more complex theories to explain cross-national public opinion on climate change. I hypothesize that the effect of an individual-level characteristic, such as left-right political orientation, is conditional on a country-level factor, such as income. To test these hypotheses, I need to use cross-level level interaction terms. Equation 8 shows a cross-level interaction model with one individual-level and one country-level variable.

$$(8)\ y_i^* \sim (\alpha_{j[i]} + \beta_k x_{i[k]}, \sigma_y^2)$$

$$\begin{bmatrix}\alpha_k\\ \beta_k\end{bmatrix} \sim N\left(\begin{bmatrix}\gamma_{00}+\gamma_{01}z_j\\ \delta_{00}+\delta_{01}z_j\end{bmatrix}, \Sigma\right)$$

The country-level factor z_j is included to explain variation in both coefficient and intercept estimates across countries. So a country-level variable that measures wealth, such as GDP per capita, would be included to explain differences across countries for the predictive effect of an individual-level characteristic, such as left-right political orientation, and also to explain variation in the level of a dependent variable, like perceived seriousness of climate change, across countries. The variance-covariance matrix is the same as in the random-intercept, random-coefficient model, with the variance of the intercept, the variance of the coefficient, and the covariance of the intercept and coefficient.

The dependent variables are measured at different levels in this project. Some variables, such as saying climate change is the most important environmental problem or not, are binary, some variables are ordinal, such as the perceived seriousness of climate change, and some variable are assumed to be continuous-like, such as the perceived dangerousness of climate change. Using a linear functional form to predict an ordinal or binary dependent variable could be problematic for a number of reasons. Most important, a linear model could produce inaccurate standard errors, thus resulting in incorrect significance testing.

In order to motivate both the binary and ordered models, I assume the underlying attitude that motivates responses to these survey questions is unobserved, latent, and continuous (Hedeker and Gibbons 1994, Hedeker 2008, Bauer and Sterba 2011). If I could observe this latent attitude, they would be continuous, and allowing for a linear functional form. This continuous underlying attitude is y_i^*. The observed categorical response is based on this unobserved attitude, and response categories are determined by in a certain range in the observed attitude. I link the latent model with the observed values of climate change risk perception with a threshold model, in which the thresholds determine the observed values.

$$(9)\ y_i^* \sim (\alpha_{j[i]} + \textstyle\sum_{k=1}^{k} \beta_k X_{ki}\,, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00}\,, \sigma_\alpha^2)$$

This is the connection between the latent and observed variables in the ordered model for a dependent variable with four ordered choice categories.

$$(10)\ y_i = 1\ if\ y_i^* < c_1$$

$$y_i = 2\ if\ c_1 \leq y_i^* < c_2$$

$$y_i = 3\ if\ c_3 \leq y_i^* < c_2$$

$$y_i = 4\ if\ y_i^* \geq c_4$$

Finally, I need to specify distributions for the individual-level variance and country-level variance. The individual-level variance in a binary and ordered random-intercept and random-intercept, random-effect models are fixed. I use the logistic distribution, so the individual level variance is fixed at $\pi^2/3$ for both the binary and ordered models. And at the country-level, the variance is assumed to follow the normal distribution, just as in the multilevel model because the random effects are not impacted by the response function.

I also need to clearly specify the meaning of the intercept in multilevel binary and ordered models in which the level of the dependent variable is assumed to vary across context. In a multilevel random-intercept linear model, the country-specific intercepts vary across countries. In the multilevel binary model, the country-specific thresholds vary across countries. And in the ordered multilevel model, the first threshold is allowed to vary. The other thresholds for the latent variable are determined by the variation in the first threshold, so the distance between the thresholds in the latent variable model is the same across countries.

The linear multilevel models are estimated using maximum likelihood estimation methods, in which the specification of the of the two disturbance terms is normal. The binary and ordered logistic multilevel models are estimated using adaptive Gauss-Hermite quadrature as the integration method.[10]

3.7.2 Exploratory factor analysis

I use exploratory factor analysis in Chapter 7 to explore the dimensions of concern about environmental problems. Surveys often ask respondents a series of questions in an effort to more

[10] The multilevel models were estimated using Stata 13.

precisely estimate latent attitudes, opinions, or evaluations. In this case and many others, it is assumed that there is one or are two observed factors motivating the responses to survey questions. Exploratory factor analysis, unlike confirmatory factor analysis, makes no prior assumptions about these latent factors. Factor analysis is model of linear correlation among variables; it then extracts common factors which explain as much of the common variance shared by responses to the survey questions. One way to think of exploratory factor analysis is as multivariate regression, with the common factors as the independent variables explaining variables in the observed dependent variables. The goal is to determine and identify the latent attitudes that are motivating responses to specific questions (Bartholomew, et al. 2008, Mulaik 2010). Here, the goal is to explore latent attitudes toward environmental problems.

Chapter 4: What explains cross-national climate change risk perception?

4.1 Introduction

The previous chapter introduced competing explanations for variation in individual concern about the environment and climate change from previous research, both cross-nationally and in the United States. This research contends that the direction of the relationship between factors such as post-materialism, individual-wealth, country-affluence, and religiosity with climate change risk perception could be different. This chapter tests hypotheses from these competing explanations by using cross-national public opinion data from the World Values Survey (WVS) from 2005-2009. By using the WVS, I can include a diverse group of more than three dozen countries in the analysis.

From the empirical analysis, I make three main conclusions. First, individuals across countries think of climate change as a political issue. On average, across dozens of countries, how individuals think about politics and identify politically, but not their attitudes on economics and social issues, are closely related to climate change risk perception. Second, educated individuals are more likely to say climate change is serious than those less educated on average across countries; education has a substantively important influence on climate change risk perception. Third, citizens in very rich and developed countries are not more worried about climate change than citizens in less rich and developed countries. Other approaches to the study of public opinion on the environment were not as strongly supported empirically. Religiosity and religious identity are not clearly related to perceived seriousness, providing little evidence in support of the White Thesis across countries. Post-materialism is weakly associated with perceived seriousness, showing that fundamental values changes are not strongly related to risk perception. And self-described income and socio-economic class, even if imprecisely measured, do not influence climate change risk perception. Finally, the assumption that younger people are more concerned about climate change is not supported. Instead, across countries, the relationship between age and the perceived seriousness of climate change seems to be curvilinear. Younger and older individuals are less likely to say climate change is serious than those in middle age

4.2 Hypotheses

From the discussion in the previous chapter, which introduced explanations for both individual-level and country-level variation in concern about climate change, I introduce the following hypotheses. This discussion of previous theoretical and empirical work yields a number of conflicting, competing expectations. Table 4.1 summarizes the theoretical perspective, the resulting hypotheses, and empirical measures. Table 4.1 also provides expected direction of the empirical expected based on the hypotheses. First, on the relationship between post-materialism, wealth, affluence, and climate change risk perception, the theoretical approaches on explaining attitudes toward environmental protection predict the relationship could be positive, zero, or even negative. According to post-materialism theory, I expect a positive relationship between individual post-materialism and concern about climate change because of the values changes:

> *H1: Individuals with post-materialist values consider climate change more serious than those with survivalist values* (post-materialism theory).

According to the alternative approach to explaining this relationship, there is no relationship or even a negative relationship between post-materialism and concern about climate change.

> *H2: Individuals with post-materialist values do not consider climate change more serious than those with survivalist values* (alternative approach)

The affluence hypothesis posits that the relationship between wealth and concern is direct, rather than indirect; therefore, I should expect a positive relationship between individual affluence and saying climate change is serious.

> *H3: Rich individuals consider climate change more serious than poor individuals* (affluence hypothesis).

The affluence hypothesis also holds that country wealth and level of development is positively related to perceived seriousness.

> *H4: Individuals in rich and more developed countries consider climate change more serious than individuals in poorer and less developed countries* (affluence hypothesis).

The alternative approach, however, predicts wealth and perceived seriousness of climate change are not positively related, both at the individual-level and country-level. First, individual wealth could not be associated or even negatively associated with perceived seriousness of climate change:

> *H5: Rich individuals do not consider climate change more serious than poor individuals* (alternative approach).

The alternative approach also holds that citizens of affluent countries are not more likely to say climate change is a serious problem than citizens of less affluent countries.

> *H6: Individuals in rich and more developed countries do not consider climate change more serious than individuals in poorer and less developed countries* (alternative approach).

Next, the relationship between religiosity and climate change risk perception could be either positive or negative. Previous empirical and theoretical work, based on the White thesis and focused on the United States, predicts a negative relationship:

> *H7: More religious individuals consider climate change less serious than less religious people* (supporting the White Thesis).

This previous work building on the White Thesis also predicts that Protestants are less likely to be concerned about the environment and less likely to say climate change is serious.

> *H8: Protestants consider climate change less serious than non-Protestants* (supporting the White Thesis).

Or it could be that the United States is exceptional because of its relatively large group of evangelical and conservative Christians, and cross-nationally, the religiously devout are not more likely to say climate change is serious.

> *H9: More religious individuals do not consider climate change less serious than less religious people* (opposing the White Thesis).

And a cross-national study could also find that Protestants are actually about as likely or even more likely to see climate change as a serious problem.

H10: Protestants do not consider climate change less serious than non-Protestants (opposing the White Thesis).

The discussion on the relationship between political ideology, partisanship and concern about climate change yields a number of hypotheses. First, based on previous empirical research on public opinion on the environment and climate change in the United States, I expect left-right political orientation to predict perceived seriousness of climate change.

H11: Individuals on the left consider climate change more serious than individuals on the right.

Finally, I also explore the relationship between political knowledge and engagement and education and perceived seriousness of climate change. The relationship could be direct, as posited by the deficit model. So as an individual's education and political engagement increases, he or she also becomes more likely to say climate change is serious.

H12: As an individual's level of education and political interested increases, he or she considered climate change more serious (the deficit model).

Or it could be that the relationship between knowledge and concern about climate change is conditional on political ideology and/or political partisanship, as predicted by approaches that emphasize motivated reasoning and elite cues. According to motivated reasoning theory, only sophisticated individuals are able to use their political ideology and partisanship to form an opinion on an issue such as climate change. And proponents of the elite cues approach contend only sophisticated individuals are able to utilize cues from ideologically similar political elites. Therefore, according to these two approaches, the difference between the left and right in perceived seriousness of climate change increases as level of education, interest in politics, and knowledge about the environment increases.

H13: As an individual's level of education and interest in politics increases, the difference between the left and right in perceived seriousness of climate change increases (motivated reasoning and elite cues).

Recent empirical research on public opinion in the United States has found empirical evidence in support of this hypothesis. Here I test to see if this finding is also supported in the cross-nationally.

Table 4.1: Theory, hypotheses, and empirical expectations

Theoretical Perspective	*Concept*	*Variable*	*Hypothesis/Hypothesis*	*Empirical Expectation*
Post-materialism Theory	Post-materialism	Post-materialism	H1: Individuals with post-materialist values consider climate change more serious than those with survivalist values.	+
Alternative Approach			H2: Individuals with post-materialist values do not consider climate change more serious than those with survivalist values.	0 or -
Affluence Hypothesis	Individual Wealth	Socioeconomic Class Income Decile	H3: Rich individuals consider climate change more serious than poor individuals.	+
Alternative Approach			H5: Rich individuals do not consider climate change more serious than poor individuals.	0 or -
Affluence Hypothesis	Country Wealth/ Development	GDP per capita Human Development Index (HDI)	H4: Individuals in rich and more developed countries consider climate change more serious than individuals in poorer and less developed countries.	+
Alternative Approach			H6: Individuals in rich and more developed countries do not consider climate change more serious than individuals in poorer and less developed countries.	0 or -
Supporting the White Thesis	Religiosity	Attendance of religious services	H7: More religious individuals consider climate change less serious than less religious people.	-

Table 4.1 (cont'd)

Opposing the White Thesis			H9: More religious individuals do not consider climate change less serious than less religious people.	+
Supporting the White Thesis	Protestantism	Protestant Identity	H8: Protestants consider climate change less serious and dangerous than non-Protestants.	-
Opposing the White Thesis			H10: Protestants do not consider climate change less serious than non-Protestants.	+
Left-right political orientation	Self-described Political Ideology	Placement on the left-to-right continuum	H11: Individuals on the left consider climate change more serious than individuals on the right.	-
Deficit Model of Science Communication	Education, Political Interest	Level of education Political interest Self-described environmental knowledge	H12: As an individual's level of education, political interest, and knowledge increases, he or she considered climate change more serious.	+
Motivated Reasoning Theory/Elite cues	Education, political interest, and environmental knowledge conditioned on political ideology	Level of education Political interest Left-right political orientation	H13: As an individual's level of education, political interest, and knowledge increases, the difference between the left and right in perceived seriousness of climate change increases.	The difference between left and right increases as education and political interest increases

4.3 Measurement

4.3.1 Dependent variable

The dependent variable captures individual perception of the seriousness of climate change using the WVS. Specifically, as mentioned in previous chapters, WVS asked respondents: "Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or the greenhouse effect."

4.3.2 Independent variables at the individual level

Measurement is explained in detail in Appendix A and Table 3.1 provides the variables used to measure concepts introduced in the previous chapter. The following variables are used in different model specifications.

- Post-materialism: In the WVS, post-materialism is a twelve item-index measuring values, running from -2.5, equated with materialist values, to 2.5, equated with post-materialist values.
- Left-right political orientation: I include a self-described political ideology to measure left-right political orientation. In the WVS, respondents were asked to place themselves on a range from one to 10, in which one indicates far left and 10 indicates far right.[11]
- Economic attitudes: Questions are included to measure opinions on income inequality and private enterprise. Respondents were asked to place their opinion on the appropriate level of income inequality a range from one to 10, with one indicating "incomes should be made more equal" and 10 indicating "we need larger income differences for individual effort". Respondents are also asked to place their opinion of private enterprise on a range from one to 10; 1="private ownership of business and industry should be increased"; 10= "government ownership of business and industry should be increased". These variables are recoded so individuals who took positions on

[11] Self-placement on a single dimension of ideology, from left to right, is often used in public opinion research, but it can be problematic. First, individuals struggle to place themselves in many individuals across countries on the left-right continuum because there is wide cross-national variation in the use and mean of the left-right distinction in politics. The variation in the use of the left-right continuum on the WVS is explored in more detail in Chapter 4.

Second, responses to the self-placement question are clustered in the middle categories. Of those respondents who place themselves on the left-to-right-continuum in all 42 countries (respondents in China and Malaysia were not asked to describe their political ideology), 39 percent choose one of the two middle categories, so identifying as self-described moderates. In only three of the countries—Italy, Vietnam and Jordan—is one of two middle categories out of the 10 categories not the modal response. This could show that many citizens across these countries consider themselves moderates. Or this finding could be the result of social desirability bias because respondents think choosing a category in the middle shows they are moderates, and believing this answer is socially desirable. After all, ideologically extremists are often viewed with suspicion. So self-placed ideology may be underestimating the variance in left-right political orientation.

the economic issue to the left of center were given negative numeric values and those with positions right of center were given positive numeric values.[12]

- Social values index: I also include a measure of position on social issues, which combines answers to questions about whether homosexuality, abortion, divorce, and euthanasia are never justifiable, always justifiable, or somewhere in between.[13] This measure captures the social dimension of left-right political orientation, with negative numeric values reflecting views on the left on social issues and positive numeric values capturing views on the right on social issues.
- Education: I include an ordinal measure of education level with values ranging from no formal education to primary education to secondary education to attending and completing university education. According to previous research, I expect greater education to increase to likelihood of saying climate change is a serious problem.
- Interest in politics: I also include an ordinal measure of interest in politics, a four category variable ranging from not at all to very interested in politics. Higher values are associated with greater interest in politics. According to previous research, I expect increased interest in politics to increase the probability of saying climate change is a serious problem.
- Individual Wealth: To test the affluence hypothesis at the individual level, I measure two different measures—self-described socio-economic class and self-described income decile.[14]

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[12] These two questions and other questions on government welfare and the role of competition do not seem to capture the same latent attitude on economic issues. They are weakly correlated with each other and do not map onto a common factor in an exploratory factor analysis. Even in the United States, these variables were not capturing the same latent economic attitude (Budge, et al. 2001).

[13] This measure is adapted from Benoit and Laver 2009. Unlike the questions on economics, responses to these social questions were unidimensional. Across all countries, responses to these questions map onto the same common factor, which explains 57 percent total variance in the four variables. All four measures were highly correlated with the common factor. Abortion was the most related with the common factor (0.83), followed by divorce (0.78), gay (0.75), euthanasia (0.66). In addition, specifically in the United States, the four measures mapped onto one common factor, with the common factor explaining 56 percent of the variance in the measures. The four measures are also highly correlated with the common factor, with abortion once again most closely related (0.88), followed by divorce (0.73), euthanasia (0.70), and gay (0.66).

[14] These measures of individual affluence can be problematic though. First, they were self-described, and individuals might not accurately answer these questions, either because they do not know their relative position in society or due to social desirability bias. Fewer respondents than expected answer that they were in the upper class or the upper

First, I include a respondent's self-described economic class—with categories ranging from lower class to upper-middle class/upper class. Second, I use their self-described income decile, from one, the first decile, to ten, the top decile.

- Religiosity and Religious Identity: I measure religiosity with two variables. First, I measure attendance of religious services, by capturing how often respondents say they attend religious services. Second, I also include a measure capturing the self-described importance of God for the models using the WVS data.[15] I also measure for the effects of religious identities. Considering the White Thesis focuses generally on Christian identifies and specifically on Protestantism, I measure for the effect of identifying as a Protestant, Catholic, or Evangelical. I also measure for the effect of measure of identifying as a Muslim. By including measures of both religiosity and religious identity, I am testing for applicability of the White Thesis on climate change risk perception.

4.3.3 Control variables at the individual-level

I include age and gender as control variables. I would expect younger people to be most likely to say climate change is a serious issue based on cohort replacement theory, in which younger cohorts are more concerned about environmental issues than older cohorts because of changes in values (Inglehart 1977, Inglehart and Welzel 2005). One recent cross-national study using the WVS found that the effect of

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income deciles, and more respondents than expected answer they were in the middle class or middle income deciles, illustrating that social desirability almost certainly biases answers to these questions. In the WVS across 43 countries, only slightly greater than one percent described themselves as "upper class". Fifteen percent describe themselves as "lower class", 27 percent as "working class", 33 percent as "lower middle class", 17 percent as "upper middle class", and seven percent do not answer the question. Because so few respondents identify as "upper class", "upper class" is collapsed with "upper middle class" into the same category to represent people who consider themselves high income. And when asked on the WVS to place themselves into their income decile, only about four percent of respondents placed themselves into the one of the top two deciles. Meanwhile, about 40 percent place themselves into one of the three middle deciles. So when respondents are asked about their income or class, some understate their place in society, which could lead to misleading results.

Second, the measures capture a respondent's assessment of his or her relative wealth in their country, by asking respondents to compare themselves to others within their country, not to others in the world as a whole. So the measure captures a respondent's assessment of his or her relative wealth within his or her country, even though their self-described wealth among all of the surveyed countries might be different. It might be asking too much of respondents to compare their affluence to the whole world, however, and this might lead to further response bias.

[15]Across the 44 countries in the WVS, a majority of 51 percent responded God is "very important", the highest ordered response category; this distribution is heavily skewed.

age on risk perception of climate change was nonlinear, with those in middle age more concerned than the young and old (Kvaløy, et al. 2012). To allow for the possibility of a nonlinear relationship, in both cross-national surveys, age is included in categories: under the age of 30; 30-39; 40-49; 50-59, 60-69, and 70 and older. As for the effect of gender, research based on the United States has found that women are likely than men to be concerned about the environment (Eckberg and Blocker 1989) and climate change (Kellstedt, et al. 2008).

4.3.4 Independent variables at the country-level

The primary independent variable of interest at the country-level is the country's wealth and level of development.[16] I measure country affluence with each country's mean GDP per capita. I measure country affluence and development with two variables: mean GDP per capita between 2005 and 2009 and mean Human Development Index (HDI) score between 2005 and 2009. While GDP per capita measures country wealth directly, HDI, which encompasses life expectancy and education in addition to income, provides broader measure of the country's development. These two variables are included to test for the predicted positive relationship between country affluence and concern based on the affluence hypothesis.

In addition to these two variables measuring a country's wealth, I also include additional country-level factors in the multilevel models. Many of these variables have not been included in previous cross-national studies on climate change public opinion. First, I test for the effect of CO_2 emissions in a country, measuring mean CO_2 emissions in tons per capita from 2005 to 2009. Previous research has yielded somewhat divergent expectations for the effect of CO_2 emissions. Franzen and his co-authors (Franzen 2003, Franzen and Meyer 2010) find a positive relationship between CO_2 emissions and broad concern for the environment. Sandvik (2008) find a weak, negative relationship between CO_2 emissions and aggregate country-level concern about climate change. They posit that the inconsistent empirical findings on the effect of CO_2 emissions could be the result of different samples of countries.

Next, while previous work on cross-national public opinion on climate change has looked at the impact of CO_2 emissions, the demand-side of the fossil fuel industry, it has largely ignored the impact the

[16] Appendix A provides more information, including data sources, on the country-level variables.

supply of energy could have on public opinion on climate change. Suppliers in the fossil fuel industry arguably have more at stake in maintaining the status quo global energy economy. Widespread concern about climate change could lead to global policy changes, which hurts fossil fuel supplying countries. For example, policy changes could lead to increased demand for alternative forms of energy and decreased demand for traditional energy. Therefore, perceived seriousness of climate change could be lower in countries in which fossil fuel is produced. To measure the impact of oil and gas production, I use the natural logarithm of the value of the mean of per capita oil and gas production in each country between 2005 and 2009 (Ross 2013). I also include two additional country-level factors that could be related to concern about climate change. First, I look at the impact of democracy, as measured by a country's mean polity score between 2005 and 2009. It could be that as a country becomes more democratic, its citizenry becomes more include to consider climate change serious. Second, I also explore the possible effect of income inequality, as measured by a country's mean GINI coefficient between 2005 and 2009. It could be that perceived seriousness of climate change is greater in countries with less income inequality.

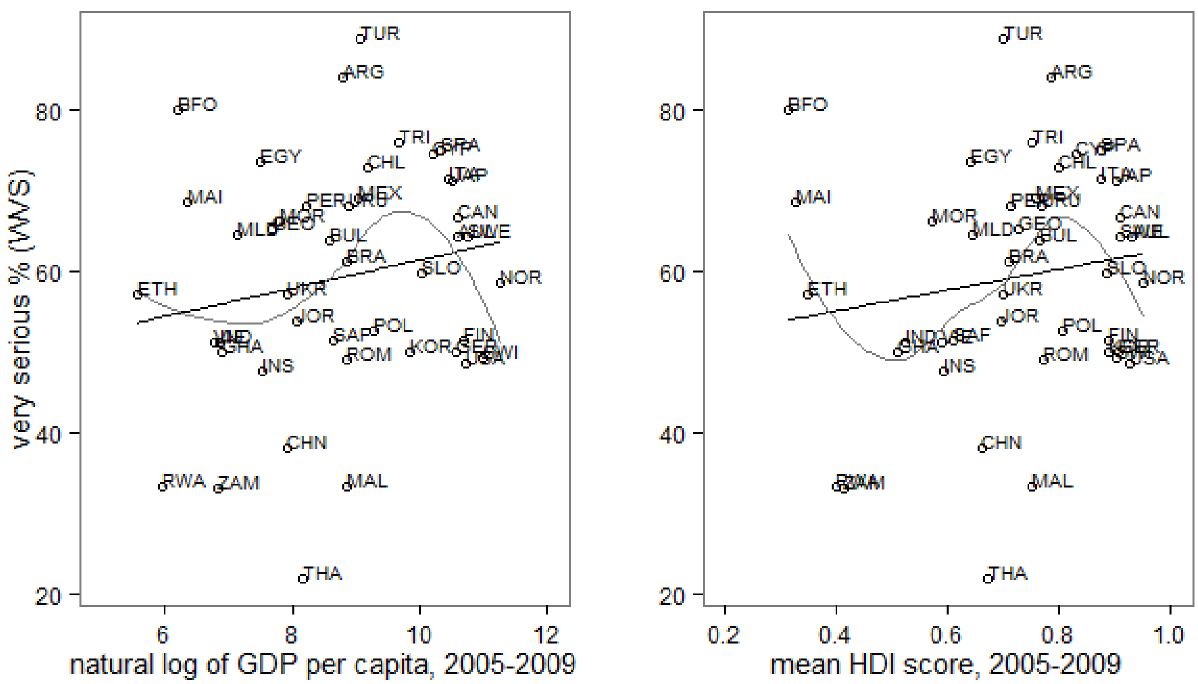
4.4 Explaining cross-national climate change risk perception

Before jumping into the results and analysis of the multilevel models, I first present preliminary evidence that the publics perceived dangerousness of climate change does not increase as a country-level wealth and development increased. Figure 4.1 shows the relationship between GDP per capita, HDI, and aggregate perceived seriousness. Figure 4.1 provides evidence that the relationship between wealth and climate change risk perception is not positive at the country-level. The fifth round of the WVS includes a broad sample of countries, including less developed and poorer countries. With this broader sample of countries, the evidence suggests that country wealth and development is not positively related to aggregate perceived seriousness. Although the linear regression line has a positive slope, slope estimates for GDP per capita and HDI are substantive weak and not significantly different from zero.[17] And the loess curve suggests that the percentage of those who answer that climate change is a "very serious"

[17] Both HDI (p=0.307) and the natural logarithm of GDP per capita (p=0.221) are not statistically different from zero in a simple linear regression.

problem decreases, increases and then decreases again across values of GDP per capita and HDI, evidence to suggest that the publics of very rich countries are not more worried about climate change than citizens of middle-income countries.[18] The results of this aggregate-level analysis show that wealth and development is not positively associated with perceived seriousness of climate change, contrary to the expectations of the Affluence Hypothesis.

Figure 4.1: Relationship between wealth/development and perceived seriousness of climate change, by country (World Values Survey 2005-2009**)**



Notes: The scatterplot shows the country-level relationship. The black line is linear best fit, while the grey line is the loess curve.

Next, I present the results of models predicting individual perceived seriousness of climate change. For these models presented in the text, I use an ordered logistic functional form to predict risk perception of climate change, so the individual-level variance is fixed and not estimated as part of the model. The latent variable formula is presented below with a vector of individual-level characteristics

[18] To test this nonlinear relationship, I ran polynomial regression models with squared and cubic terms predicting the proportion of citizens in each country to view climate change as very serious. All three HDI terms were statistically different from zero (all three *p*<0.01), while the terms for the natural logarithm of GDP model are not statistically different from zero (all three *p*=0.18).

without any country-level characteristics, since the first set of statistical models do not include any country-level predictors.

$$(1)\ (seriousness\ of\ climate\ change)^{*}{}_{i} \sim N(\alpha_{j[i]} + \sum_{k=1}^{k} \beta_k x_{ki}, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00}, \sigma_\alpha^2)$$

The estimates for random-intercept multilevel models allowing the first cut point to vary across countries without country-level variables are presented in Table 4.2. Figure 4.2 summarizes the predictive effects of the individual-level predictors. I use these models to explore the relationship of the individual-level variables with perceived seriousness of climate change before turning to models with country-level covariates.[19]

First, the association between post-material values and perceived seriousness of climate change is statistically significant, but the substantive association is quite small. Individuals with post-material values (post-materialism=1.5) are only about four percent more likely than those with more materialist values (post-materialism=-1.5) to consider climate change very serious. So the adoption of post-material values does not drastically increase the likelihood of considering climate change a serious problem.[20]

Second, how individuals think about politics is closely related with worry about climate change. Across countries, an individual who identifies with the left is more likely to say climate change is serious than an individual who identifies with the right. Specifically, an individual on the right (political ideology=8) is predicted to be 5.5 percent less likely to consider climate change very serious than an individual on the left (political ideology=3) [95 percent confidence interval: -0.072, -0.028]. And Model 3 provides evidence that the being on the right has a stronger effect than being on the left. Model 3 shows that the coefficient estimate for self-described political ideology on the right (political ideology=7-10) is more than double the absolute size of self-described political ideology on the left (political ideology=1-4).

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[19] The substantive effect and statistical significance of the coefficient estimates for the individual-level variables are very similar in both the random effects and multilevel models.

[20] Unless explicitly mentioned, Model 6 in Table 4.2 is used to calculate the predicted probabilities and first differences with the other covariates held at their means and modes.

Specifically, an individual on the right is predicted to be a little more than about five percent less likely to consider climate change very serious than a moderate (political ideology=5-6), while an individual on the left is predicted to be about two percent more likely to consider climate change very serious compared to a moderate. So on average across countries, being on the right has a stronger influence on climate change risk perception than being on the left.

But how people think about economic and social issues is not associated with perceived. Both measures of views on economic issues are not statistically significant. And the social issues index does have its expected sign, but it is not statistically significant at conventional levels in either Model 4 or Model 5.

Education and political interest have their expected relationship with perceived seriousness of climate change, as an increase in both is associated with an increase in perceived seriousness. The coefficient estimates for both variables are statistically significant, but their substantive impact is vastly different. An individual whose political interest moves from not very interested to very interested has a resulting increase in the predicted probability of viewing climate change as very serious by only about four percent. But an individual with a university degree are predicted to be about 11 percent more likely to consider climate change very serious than an individual who completed secondary school but did not pursue additional university or vocational education [95 percent confidence interval: 0.074, 0.141]. Education has the strongest substantive predictive influence on perceived seriousness of the individual-level variables in the model.

The relationship between religiosity and religious identity and the perceived seriousness of climate change is more complex. The coefficient estimate for religious attendance is negative, but not statistically different from zero. The negative, statistically significant influence of Protestant identity in some model specifications is evidence supportive of the White Thesis. But the association is quite weak. Specifically, a Protestant is predicted to be about three percent less likely to consider climate change very serious than an individual who does not self-identify as Protestants and the estimate is very uncertain (95 percent confidence interval: [-0.064, -0.001]. As shown in Model 1 in Table 4.2, the coefficient estimates for Catholic, Evangelical, and Muslim identities are not significantly different from zero compared to individuals who do not identify with these religions.[21] Finally, the most important finding in opposition to the White Thesis is the strong positive association between the importance of God and perceived seriousness of climate change. This showed a possible disconnection between religiosity and spirituality in the formation of attitudes on climate change. One does not necessarily need to attend church to consider God very important, so it seemed that more spiritual individuals are more likely to say climate change is serious, while those who were formally religious are less likely to say climate change is serious.

Self-described wealth is measured in two ways in the models analyzing the WVS—self-identified class and income decile, and both measures of individual affluence are not related to perceived seriousness of climate change, refuting the Affluence Hypothesis at the individual-level. Self-described socio-economic class is estimated using a series of dummy variables, with the reference category as middle class. Lower class, working class, and upper class are all not significantly different from middle class in the probability of saying climate change is very serious. Moreover the classes were not significantly different from each other.[22] The coefficient estimate for self-described income decile in Model 2, in which respondents place themselves in deciles compared themselves to others in their country, is not statistically different from zero. So even though individual wealth is not measured precisely, the Affluence Hypothesis at the individual-level is not supported in the analyses.[23]

As for the two control variables, women are more likely to say climate change is serious than men in only two model specifications, and the predicted substantive effect is weak, as women are only about 1.5 percent more likely to consider climate change very serious than men. The finding for age is

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[21] Using an F-test, I compared the coefficient estimates for the religious identities, and they are not significantly different from each other at a standard level. Protestant is not significantly different from Evangelical (p=0.556), Catholic (p=0.223), or Muslim (p=0.079). Catholic is not significantly different from Evangelical (p=0.869) or Muslim (p=0.087). And Evangelical is not significantly different from Muslim (p=0.208).

[22] Using an F-test, I compared the coefficient estimates. Lower class is not significantly different from working class (p=0.974) or upper class (p=0.927). And working class is not significantly different from upper class (p=0.86).

[23] In models predicted perceived dangerousness of climate change using the International Social Survey Programme data, self-placed income decile is not a statistically significant predictor.

particularly interesting and deserves further discussion. In all five models, individuals younger than 30 are less inclined to consider climate change very serious than those between the age of 40 and 49, the reference category once again in all models. Specifically, an individual younger than 30 is predicted to be about three percent less likely to view climate change as very serious compared to 40 to 49 year-olds. Individuals 70 and older are less inclined to say climate change is serious those 40 to 49 years old, but the coefficient estimate for individuals 70 and older is not statistically different from zero.[24] This finding suggests that the relationship between age and concern is not linear, with perceived seriousness not decreasing with age, but instead curvilinear, with concern peaking in middle age.[25]

[24] A statistical modeling including terms for both age and age squared is presented in Appendix D (Table A4.2). Both terms are statistically significant at conventional levels, providing further evidence of a nonlinear relationship between age and climate change risk perception.

[25] The cut points for underlying latent perceived seriousness of climate change in the random-intercept, ordered logistic regression model should be discussed briefly. First, the cut points are all significantly different from each other, suggesting that four response categories are distinct and meaningful. Second, the three cut points are also almost equally spaced out.

Table 4.2: Random-intercept ordered logistic multilevel models without country-level variables predicting perceived seriousness of climate change (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)	(5)	(6)
Political ideology	**-0.0474**	**-0.0462**			**-0.0483**	**-0.0473**
(from left to right)	(0.0133)	(0.0131)			(0.0128)	(0.0126)
Left			**0.1012**			
(ideology=1-4)			(0.0436)			
Right			**-0.2042**			
(ideology=7-10)			(0.0675)			
Social issues index				-0.0266	-0.0270	
				(0.0154)	(0.0157)	
Income equality				-0.0012	-0.0027	
				(0.0101)	(0.0100)	
Private enterprise				0.0061	0.0104	
				(0.0104)	(0.0091)	
Post-materialism index	**0.0715**	**0.0638**	**0.0652**	**0.0619**	**0.0634**	**0.0660**
	(0.0221)	(0.0225)	(0.0220)	(0.0230)	(0.0247)	(0.0221)
Interest in politics	**0.0602**	**0.0655**	**0.0643**	0.0286	**0.0503**	**0.0628**
	(0.0206)	(0.0208)	(0.0193)	(0.0216)	(0.0224)	(0.0200)
Education level	**0.0900**	**0.0960**	**0.0928**	**0.0838**	**0.0856**	**0.0928**
	(0.0137)	(0.0143)	(0.0140)	(0.0152)	(0.0158)	(0.0140)
Attendance of religious services	-0.0185	-0.0209	-0.0237	-0.0262	-0.0249	-0.0240
	(0.0145)	(0.0151)	(0.0142)	(0.0143)	(0.0149)	(0.0142)
Importance of God	**0.0457**	**0.0459**	**0.0462**	**0.0471**	**0.0487**	**0.0461**
	(0.0086)	(0.0082)	(0.0084)	(0.0082)	(0.0094)	(0.0085)
Protestant	**-0.1614**	**-0.1646**	**-0.1464**	-0.1053	-0.1280	-0.1443
	(0.0820)	(0.0802)	(0.0740)	(0.0687)	(0.0790)	(0.0747)
Catholic	-0.0406	-0.0403				
	(0.0483)	(0.0476)				
Evangelical	-0.0452	-0.0492				
	(0.0410)	(0.0480)				
Muslim	0.0755	0.0641				
	(0.0936)	(0.0964)				
Lower class	0.0321					
	(0.0713)					
Working class	0.0236					
	(0.0335)					
Upper class	0.0217					
	(0.0412)					
Female	**0.0799**	0.0591	0.0684	0.0697	**0.0713**	0.0698
	(0.0357)	(0.0351)	(0.0357)	(0.0357)	(0.0353)	(0.0358)
Age under 30	**-0.1013**	**-0.1319**	**-0.1185**	**-0.1327**	**-0.1162**	**-0.1180**
	(0.0442)	(0.0460)	(0.0458)	(0.0480)	(0.0533)	(0.0461)
Age 30-39	-0.0135	-0.0166	-0.0074	-0.0239	-0.0287	-0.0089
	(0.0324)	(0.0336)	(0.0320)	(0.0368)	(0.0387)	(0.0323)
Age 50-59	0.0179	0.0184	0.0190	-0.0218	0.0079	0.0191
	(0.0340)	(0.0341)	(0.0334)	(0.0354)	(0.0376)	(0.0332)
Age 60-69	0.0062	0.0115	0.0141	0.0118	0.0173	0.0131
	(0.0465)	(0.0522)	(0.0463)	(0.0504)	(0.0531)	(0.0465)
Age 70 and older	-0.0529	-0.0432	-0.0504	-0.0669	-0.0492	-0.0512
	(0.0489)	(0.0528)	(0.0478)	(0.0527)	(0.0596)	(0.0479)

Table 4.2 (cont'd)

Self-described income decile		-0.0032 (0.0120)				
Not serious at all | Not very serious	-4.3201 (0.2233)	-4.3520 (0.2422)	-4.1069 (0.1900)	-4.0465 (0.2025)	-4.3952 (0.2335)	-4.3304 (0.2114)
Not very serious | Somewhat serious	-2.5436 (0.1678)	-2.5626 (0.1729)	-2.3319 (0.1440)	-2.2918 (0.1569)	-2.5864 (0.1704)	-2.5558 (0.1579)
Somewhat serious| Very serious	-0.5880 (0.1309)	-0.6016 (0.1350)	-0.3868 (0.1112)	-0.3821 (0.1156)	-0.6276 (0.1309)	-0.6118 (0.1236)
Variance component						
Country-level variance	**0.4143** (0.1013)	**0.3849** (0.0967)	**0.4056** (0.0991)	**(0.4095)** (0.0981)	**0.4219** (0.1049)	**0.4075** (0.0997)
Number of respondents	38753	37189	39973	39068	32855	39973
Number of countries	40	39	41	40	39	41
AIC	69509	66923	71532	71526	59865	71554

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion of missing values. Four countries are excluded from Model 1 because survey questions were not asked in these countries. In China, the self-placement political ideology question was not asked. In Malaysia, the self-placement political ideology and religious attendance questions were not asked. Also, in Morocco, the religious attendance question was not asked. Finally, in Mexico, the question about socio-economic class was not asked. In Model 2, five countries are excluded: China, Malaysia, Morocco, Jordan, and Argentina. In Jordan and Argentina, the income decile question was not asked. In Model 3, China and Malaysia are both excluded because the self-placement political ideology question was not asked in either country. In Morocco, the religious attendance question was not asked. In Model 4, in addition to excluding to Morocco, Peru, Egypt and Malaysia are excluded because the social issues questions were not asked, so respondents from four countries were excluded. In Model 5, in addition to excluding Morocco, Peru, Egypt, and Malaysia, China is excluded because self-described political ideology was re-introduced into the model, so respondents from five countries were excluded. In Model 6, China, Malaysia, and Morocco are excluded.

Next, I turn briefly to the random intercept multilevel models predicting perceived seriousness of climate change, with particular focus on the country-level predictors. The random-intercept models with no country-level predictors presented in Table 4.2 show significant variation in perceived seriousness of climate change across countries. The results of the models presented in Table 4.2 include country-level predictors in an effort to explain this variation. Equation 3 shows the latent variable specification with a vector of individual-level variables and a vector of country-level variables.

$$(2)\ (seriousness\ of\ climate\ change)^{*}{}_{i} \sim N(\alpha_{j[i]} + \textstyle\sum_{k=1}^{k} \beta_k x_{ki}, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00} + \sum_{m=1}^{m} \gamma_{0m} z_j \,, \sigma_\alpha^2)$$

None of the included country-level variables, however, have a statistically significant influence on climate change risk perception, and the estimated country-level variation in models without country-level predictors is nearly identical to the country-level variation in models with country-level predictors.[26] This finding provides further evidence that richer and more developed countries were not more concerned about climate change than poorer and less developed countries. And it also shows that other possible country characteristic do not explain country-level variation.[27]

[26] In addition, in a different model specification not shown here, GDP per capita, instead of the natural logarithm of GDP per capita, is not statistically different from zero when included as a country-level predictor.

[27] In addition, I estimated multilevel models predicting perceived seriousness with polynomial terms for GDP per capita and HDI, shown in Appendix B. These models show the nonlinear relationship between development and climate change risk perception, in which perceived seriousness increases as countries as countries go from low to medium development, but then declines when countries become very rich and development. For an average individual across countries in a country with an HDI of 0.5, the predicted probability of considering climate change very serious is about 42 percent. This predicted probability increases to 72 percent for when HDI is 0.8, a country at a pretty high level of development. But when HDI is 0.9, capturing a highly developed country, an average individual has a predicted probability of considering climate change very serious of 64 percent. This suggests that concern about climate change might decline in the richest countries.

Table 4.3: Random-intercept ordered logistic multilevel models with country-level variables predicting perceived seriousness of climate change (World Values Survey 2005-2009)

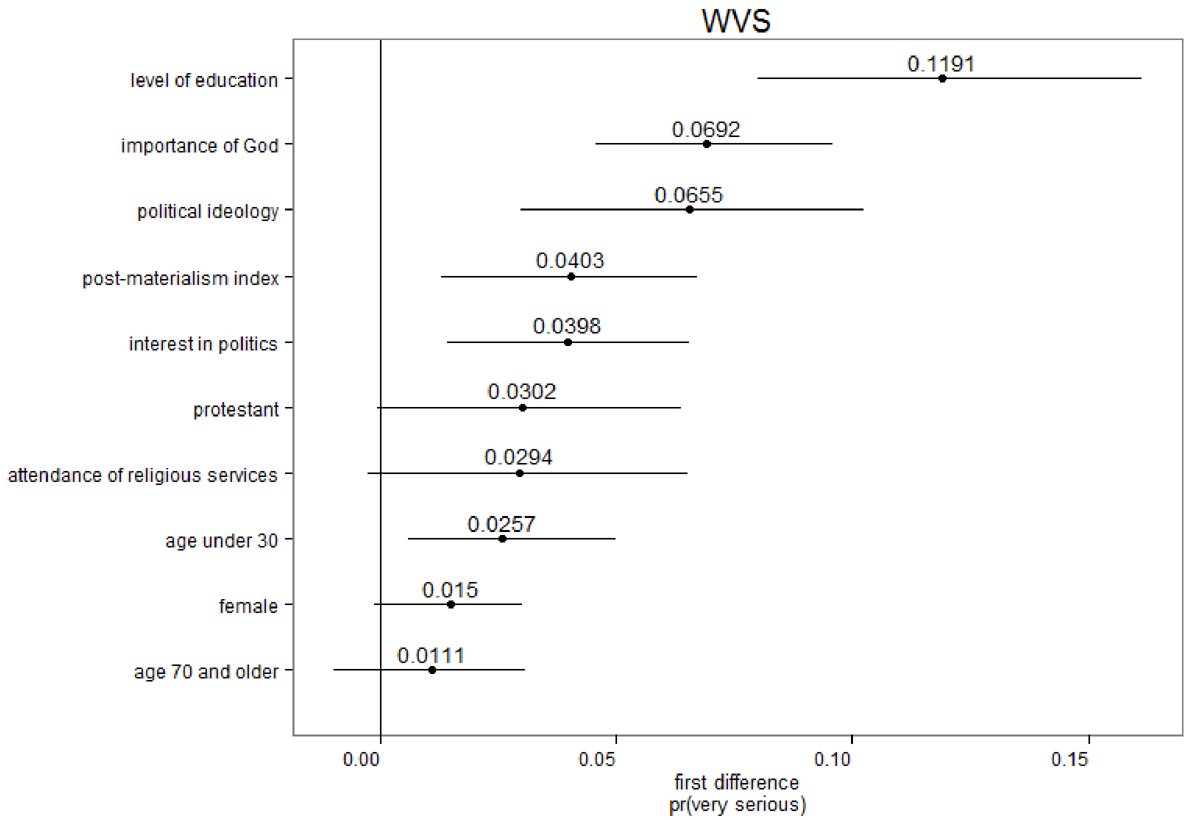
	(1)	(2)	(3)	(4)
Political ideology	**-0.0473**	**-0.0473**	**-0.0473**	**-0.0473**
(from left to right)	(0.0126)	(0.0126)	(0.0126)	(0.0126)
Post-materialism index	**0.0658**	**0.0659**	**0.0658**	**0.0658**
	(0.0221)	(0.0221)	(0.0221)	(0.0221)
Interest in politics	**0.0629**	**0.0629**	**0.0629**	**0.0630**
	(0.0200)	(0.0200)	(0.0200)	(0.0200)
Education level	**0.0926**	**0.0926**	**0.0927**	**0.0926**
	(0.0140)	(0.0140)	(0.0140)	(0.0140)
Attendance of religious services	-0.0238	-0.0238	-0.0238	-0.0238
	(0.0142)	(0.0142)	(0.0142)	(0.0142)
Importance of God	**0.0463**	**0.0462**	**0.0462**	**0.0462**
	(0.0085)	(0.0085)	(0.0085)	(0.0085)
Protestant	-0.1446	-0.1444	-0.1447	-0.1445
	(0.0747)	(0.0747)	(0.0745)	(0.0747)
Female	0.0696	0.0696	0.0696	0.0696
	(0.0359)	(0.0359)	(0.0359)	(0.0359)
Age under 30	**-0.1174**	**-0.1174**	**-0.1175**	**-0.1174**
	(0.0463)	(0.0463)	(0.0464)	(0.0463)
Age 30-39	-0.0087	-0.0086	-0.0087	-0.0087
	(0.0324)	(0.0324)	(0.0324)	(0.0324)
Age 50-59	0.0189	0.0189	0.0189	0.0189
	(0.0331)	(0.0331)	(0.0330)	(0.0331)
Age 60-69	0.0125	0.0125	0.0126	0.0125
	(0.0464)	(0.0464)	(0.0464)	(0.0464)
Age 70 and older	-0.0520	-0.0520	-0.0519	-0.0519
	(0.0478)	(0.0478)	(0.0478)	(0.0478)
Country-level variables				
Natural logarithm of mean GDP per capita	0.0490		0.0625	
	(0.0671)		(0.1080)	
Mean HDI		0.4235		0.7148
		(0.7037)		(1.2740)
Mean polity score			0.0020	0.0038
			(0.0270)	(0.0259)
Mean GINI coefficient			0.0057	0.0065
			(0.0132)	(0.0118)
Natural logarithm of CO_2 emissions per capita			0.0018	-0.0190
			(0.1279)	(0.1489)
Natural logarithm of oil and gas rents per capita			-0.0079	-0.0074
			(0.0289)	(0.0303)
Not serious at all| Not very serious	-3.8997	-4.0246	-3.5828	-3.5932
	(0.6437)	(0.5786)	(0.9964)	(0.9490)
Not very serious| Somewhat serious	-2.1251	-2.2499	-1.8081	-1.8185
	(0.6639)	(0.5903)	(1.0034)	(0.9504)
Somewhat serious| Very serious	-0.1810	-0.3058	0.1359	0.1256
	(0.6439)	(0.5701)	(1.0017)	(0.9454)
Variance component				
Country-level variance	**0.4017**	**0.4020**	**0.3995**	**0.3991**
	(0.0941)	(0.0945)	(0.0943)	(0.0941)
Number of respondents	39973	39973	39973	39973
Number of countries	41	41	41	41

Table 4.3 (cont'd)

AIC	71555	71555	71563	71563

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion used for missing values. China, Malaysia, and Morocco are excluded due to missing variables at the individual level.

Figure 4.2: Effects of individual-level variables on predicting perceived seriousness of climate change (World Values Survey 2005-2009)



Notes: The error bar represents the 95 percent confidence interval. The first differences for non-dichotomous variables were calculated using the 90th percentile and 10th percentile values of the individual-level variables. The first difference for dichotomous variables is calculated using the two categories. For the WVS, model 6 in Table 4.2 is used and the other variables were held at their means and modes. For more information, see footnote.[28]

[28] The specific values used in the calculation were as follows. For the ISSP variables: *income gap*—the difference between agree strongly and disagree; *environmental knowledge*—the difference between -1.5 and 1; *partisanship*—the difference between left party and right party identification; *education*—the difference between completing university and no formal education/primary education; *age 70 and older*—the difference between 40 to 49 years old, the reference category, and 70 years old and older; *female*—the difference between female and male; *private enterprise*—the difference between disagree and agree strongly; *age younger than 30*—the difference between 40 to 49 years old and younger than 30 years old; *protestant*—the difference between non-Protestants and Protestants; *post-materialism index*—the difference between 1 (post-materialist values) and -1 (materialist values); *attendance of religious services*—the difference between never attending and attending once a week. For the WVS variables: *level of education*—the difference between university education and incomplete primary school; *importance of God*—the difference between -2.5 and 4.5; *political ideology*—the difference between 2 and 8; *post-materialism index*—the difference between -1.5 and 1.5; *interest in politics* – the difference between very interested and not at all interested;

4.5 Conditional relationship between left-right political orientation and education/interest in politics

The above analyses present additive models, but do not allow me to test all of the proposed hypotheses. Specifically, I cannot test the hypotheses that posit that education and interest in politics condition the relationship between left-right political orientation and climate change risk perception. To test for this, I estimate a series of models predicting perceived seriousness of climate change including interaction terms at the individual-level, and allow the country-level intercepts to vary. The results shows political ideology is conditioned by self-described political interest on average, but not education, on average across countries.

Interest in politics has a conditional effect on left-right political orientation, as shown in Figure 4.3, using the WVS models. Among those who say they know nothing at all about politics, an individual on the left (political ideology=1-4) is predicted to be about four percent more likely to consider climate change very serious than an individual on the right (political ideology=7-10), an insignificant different. But among those most interested in politics, an individual on the left is predicted to be more than 10 percent more likely than an individual on the right to view climate change as very serious.[29] So left-right political orientation only influences perceived seriousness of climate change among those who are at least moderately interested in politics across countries. Specifically, among individuals on the left, increasing interest in politics has a significant effect on perceived seriousness of climate change, while for those on the right the increasing interest in politics does not have a statistically significant effect on the perceived seriousness of climate change.

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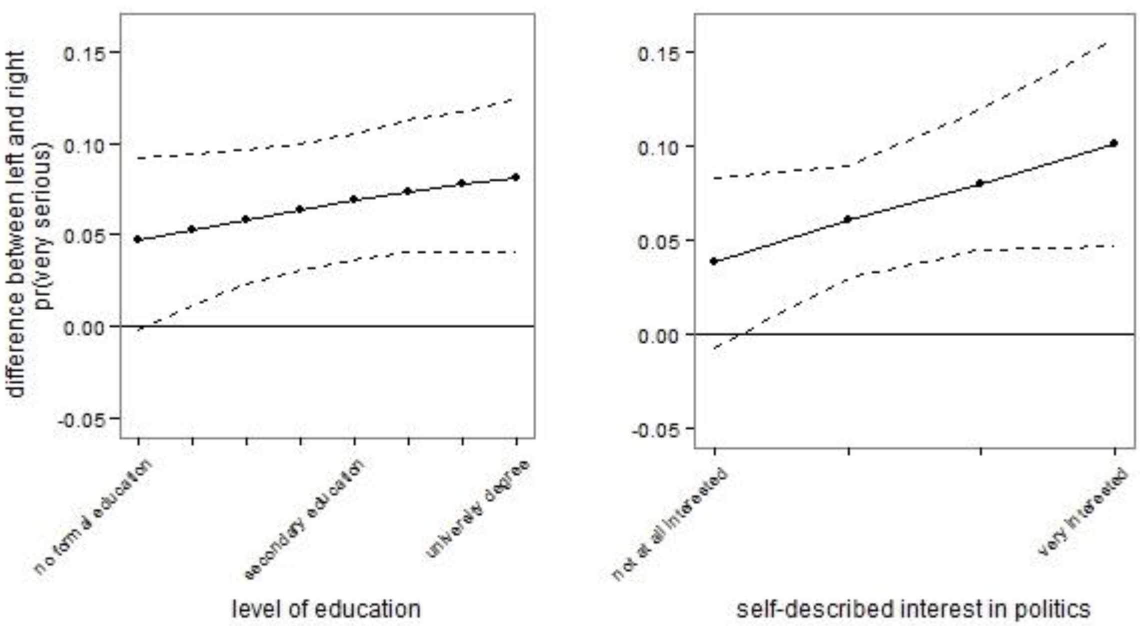
protestant—the difference between non-Protestants and Protestants; *attendance of religious services*—the difference between never and more than once a week; *age younger than 30*—the difference between 40 to 49 years old, the reference category, and younger than 30; *female*—the difference between female and male; *age 70 and older*—the difference between 40 to 49 years old and older than 70.

[29] For those individuals on the left, the predicted probability of answering very serious increased by 10.5 percent moving from the least interested to the most interested; among those on the right, this change was only four percent and not statistically different from zero.

But increasing education increased perceived seriousness of climate change on both the left and right. The divide between the left and the right also increases only slightly as education increases. Among the least educated, an individual on the left is predicted to be five percent more likely to consider climate change very serious than an individual on the right.[30] And among the most educated, this predicted difference only increases to about eight percent. Among those on the right, the predicted probability of considering climate change "very serious" increases by 13 percent moving from no formal education (the lowest level of education response category) to a university degree (the lowest level of education response category); this change is 16 percent among those on the left. So increasing education is associated with greater concern about climate change for both liberals and conservatives on average across countries.

Figure 4.3: Conditional effect of education/interest in politics on left-right political ideology on predicting perceived seriousness of climate change (World Values Survey 2005-2009)



Notes: The predicted probabilities are calculated for a 40-49 year old female with the other variables at their means or modes. The dashed lines represent the 95 percent confidence interval of the predicted probabilities.

These results presented evidence both in favor and against motivated reasoning and use of elite cues cross-nationally. How individuals described their interest in politics conditions the influence of left-right political orientation on climate change risk perception. For individuals who are not at all interested

[30] This predicted difference is not statistically significant. The large confidence interval reflected the uncertainty of the predicted difference due to the lack of respondents in the cross-national sample with no formal education.

in politics, individuals on the left and the right are statistically equally likely to say climate change is very serious. But among individuals who are very interested in politics, those on the left view climate change as significantly more serious than those on the right. But education does not condition the influence of ideology. Education increases perceived seriousness of climate change, regardless of an individual's political orientation, on average across countries.[31] This shows that the finding using public opinion surveys in the United States that education conditions the influence of left-right political orientation on climate change attitudes does not extend globally (Hamilton 2011).

4.6 Robustness checks

To check results of the analysis, I conducted numerous other analyses as robustness checks. The results of these analyses, many of which can be found in the Appendix B, are virtually identical to the results presented above, providing strong support for the research findings.

First, in the analysis above, I tested the hypotheses using only one cross-national public opinion dataset—the World Values Survey. To make sure the results are not the result of the specific use of this particular survey, I also analyze survey data from the International Social Survey Programme (ISSP). The results are nearly identical. Left-right political orientation, as measured by political party affiliation and education are strong predictors of perceived dangerousness of climate change at the individual-level. There is one important difference though. Among country-level factors, wealth and development, as measured by GDP per capita and HDI, is actually significantly and negatively related to perceived dangerousness of climate change. So individuals who live in wealthier countries say climate change is less dangerous than those who live in middle-income and wealthy countries.[32]

Second, in the above analyses, I assume an ordered logistic functional form for the WVS; the proportional odds assumption in the ordered logistic models could be problematic. The results of the

[31] This finding suggests that recent studies which found evidence of a conditional effect of education on ideology and partisanship in the United States might just be unique to the context of the United States and not extend cross-nationally. This is explored in more detail in Chapter 5.

[32] The results of analysis of the International Social Survey Programme were included in Appendix B, but a detailed discussion of the results is not included. This discussion can be provided by the author. The author can be contacted at brkennedy84@gmail.com.

analysis, however, are not sensitive to functional form. I estimated two additional models—first, a linear model predicting perceived seriousness and second, a binary logistic model predicting saying climate change is a very serious problem. The substantive results are the same as in the models presented above in the text.

Third, I use list wise deletion to deal with missingness in the statistical models in the text. Models predicting perceived seriousness of climate change using both the WVS and ISSP suffer from thousands of missing observations; the models using listwise deletion could produce less efficient and possibly biased estimates of the effects of the independent variables (King, et al. 2001). To overcome this problem of missing data, I produced multiple imputation datasets for the WVS and ISSP using Amelia II (Honaker, et al. 2011). Models on the multiple imputation data sets produce the very similar results as the list wise deletion models presented above. The models using the multiple imputation datasets are presented in the Appendix.

Table 4.4: Theory, hypotheses, and empirical expectations, and results

Theoretical Perspective	*Concept*	*Variable*	*Hypothesis/Hypothesis*	*Empirical Expectation*	*Result*
Post-materialism Theory	Post-materialism	Post-materialism	H1: Individuals with post-materialist values consider climate change more serious and dangerous than those with survivalist values	+	+ statistically significant
Alternative Approach			H2: Individuals with post-materialist values does not consider climate change more serious than those with survivalist values.	0 or -	
Affluence Hypothesis	Individual Wealth	Socioeconomic Class Income Decile	H3: Rich individuals consider climate change more serious than poor individuals.	+	Not statistically significant estimates for socioeconomic class and income decile
Alternative Approach			H5: Rich individuals do not consider climate change more serious than poor individuals.	0 or -	
Affluence Hypothesis	Country Wealth/ Development	GDP per capita Human Development Index	H4: Individuals in rich and more developed countries consider climate change more serious than individuals in poorer and less developed countries.	+	Not statistically significant for both the natural logarithm of GDP per capita and HDI
Alternative Approach			H6: Individuals in rich and more developed countries do not consider climate change more serious than individuals in poorer and less developed countries.	0 or -	
Supporting the White Thesis	Religiosity	Attendance of religious services	H7: More religious individuals consider climate change less serious than less religious individuals.	–	Not statistically significant
Opposing the White Thesis			H9: More religious individuals do not consider climate change less serious than less religious individuals.	+	

Table 4.4 (cont'd)

Supporting the White Thesis	Protestantism	Protestant Identity	H8: Protestants consider climate change less serious than non-Protestants.	-	-; statistically significant in some model specifications
Opposing the White Thesis			H10: Protestants does not consider climate change less serious than non-Protestants.	+	
Left-right political orientation	Self-described Political Ideology Self-described political partisanship	Placement on the left-to-right continuum	H11: Individuals on the left consider climate change more serious than individuals on the right.	- for political ideology; - for right party member; + for left party member	-; statistically significant for right party +; statistically significant for left party
Deficit Model of Science Communication	Education, Political Interest, and environmental Knowledge	Level of education Political interest	H12: As an individual's level of education and political interest increases, he or she considers climate change more serious.	+	+; statistically significant for level of education. Education increased seriousness for left and right.
Motivated Reasoning Theory/Elite cues	Education, political interest, and environmental knowledge conditioned on political ideology	Level of education Political interest Placement on the left-to-right continuum	H13: As an individual's level of education and political interest increases, the difference between the left and right in perceived seriousness of climate change increases.	The difference between left and right should increase as education, political interest increase.	The difference between left and right did not substantively increase as level of education increased. The difference between left and right substantively increased as interest in politics increased.

4.7 Discussion and conclusion

This chapter tests explanations for variation, both at the individual and country-level, for climate change risk perception with cross-national survey data. Many of the factors deemed important in previous research, either cross-nationally or in the United States, do not help explain climate change risk perception on average across more than three dozen countries. Instead, the explanation of what matters in how people think about climate change globally focuses on only a few factors. Table 4.4 summarizes the theoretical expectations, hypotheses, and results from this chapter.

The Affluence Hypothesis, which might explain environmental concern broadly, does not explain climate change risk perception specifically. Richer people are not more likely to say climate change is serious than poorer people. Citizens in high income countries do not consider climate change more serious and dangerous than citizens in middle-income and low-income countries. Similarly, post-materialism does not strongly influence risk perception. Although it is found to have a statistically significant relationship in the models predicting perceived seriousness, the substantive impact of post-materialism is weaker than many individual-level factors. Finally, formal experience with religion does not explain climate change. Attendance of religious services does not predict perceived seriousness of climate change.

If these broad and somewhat competing theories of environmental concern do not explain public opinion about climate change, what does matter? Climate change, unlike other environmental issues, has become a political issue in many parts of the world, including in the rich countries such as the United States. Therefore, it is not surprising that left-right political orientation influences perceived seriousness of climate change. Self-described political ideology has a statistically significant and substantively meaningful impact on perceived seriousness of climate change. Individuals on the left consider climate change more serious than individuals on the right. And the analysis also shows that being on the right has a stronger influence on climate change risk perception than being on the left.

In addition, there is some empirical evidence in support of the deficit model of science communication. More educated individuals are also more likely to say climate change is very serious than less educated individuals, regardless of their politics. But there is also evidence in support of motivated reasoning and elite cues, as the effect of self-described interest in politics is conditioned by left-right political orientation. For those on the left, increasing interest in politics and self-described significantly increases perceived seriousness, but those on the right, interest in politics does not predict perceived seriousness.

Still, this analysis leaves important questions with specific focus on the relationship between left-right political orientation and climate change risk perception. First, even though the relationship between left-right political orientation and climate change risk perception is statistically significant globally, the strength of the association could vary across countries. Is left-right political orientation more in shaping climate change opinions in some countries than in others? Second, what are those on the left more likely to think climate change is serious than those of the right? Theories are offered in the previous change, but this chapter does not explore these questions empirically. These two questions are tackled in the next two chapters.

Chapter 5: Where does left-right political orientation matter across countries?

5.1 Introduction

The previous chapter focuses on showing the average association between individual and country characteristics and climate change risk perception. On average across these countries, left-right political orientation is associated with perceived seriousness of climate change; those on the left consider climate change more serious than those on the right. By only looking at the average effect of these independent variables of interests, the important variation in both the strength and direction of the relationship between the independent variables of interest and climate change risk perception is masked. This chapter shifts the focus from estimating average effects to focusing on explaining variation across countries. Most prominently, the strength of the relationship between left-right political orientation and climate change risk perception varies across countries. What explains this variation? In this chapter, I show that a country's level of wealth and development impacts the strength the relationship between political ideology and climate change risk perception. In low and middle-income countries, left-right political outlook does not climate change risk perception, but in high-income countries, left-right political outlook has a substantively strong predictive effect. I explain this by arguing that left-right political orientation is more prevalent and closely tied to economics in richer countries.

This chapter first explains why wealth and development is connected to the influence of left-right political orientation on climate change and the environment. I emphasize that political ideology should be more closely tied to economic attitudes in rich countries than in poor countries. Second, I show that left-right political orientation is more widely used in rich countries than in poor countries. Citizens in highly developed countries are more likely to be able to place themselves on the left-right continuum than citizens in less developed countries. Third, I show the effect of left-right political orientation is conditional on wealth/development and communist history for climate change risk perception. The left-right divide on climate change and the environment almost exclusively exists in rich and wealthy countries. And in a few very affluent countries, the left and right are deeply divided on climate change

5.2 Why wealth, development, and communist experience matter

What could explain country-level variation in the influence of left-right political orientation on concern about the environment and climate change risk perception? Why could left-right political orientation matter in some contexts and not others? I argue in the this section that two important factors—country-level economic affluence/development and historical experience with communism—condition the influence of left-right political orientation on perceived seriousness of climate change.

Researchers have investigated why citizens of some countries are more likely to say climate change is serious than citizens of other countries. Scholars have particularly focused on investigating the influence of country-level affluence and development, but the empirical findings have not been conclusive. Many studies have shown that citizens in richer countries are more concerned than citizens in poorer countries about the environment generally (Diekmann and Franzen 1999, Kemmelmeier, et al. 2002, Franzen 2003, Franzen and Meyer 2010, Franzen and Vogl 2013), while other scholars have shown a negative relationship between country-wealth and concern about both the environment and climate change (Gelissen 2007, Sandvik 2008) and finally others have posited no relationship (Kvaløy, et al. 2012). Chapter 4 finds no relationship using the World Values data. In addition, I found a negative relationship between country-level affluence and perceived dangerousness of climate change using the International Social Survey Programme data. These inconclusive findings led scholars to increasingly focus on the conditional relationship country wealth and development on individual environmental attitudes (Marquart-Pyatt 2012, Nawrotzki 2012, Pampel 2014)[1].

This chapter follows this new focus. I argue that these disparate findings show that country-level wealth and development does not have a clear additive effect on concern about the environment and climate change. Instead, the influence of country-level affluence and development is conditional on left-right political orientation. Why? The salience of the influence of left-political orientation on climate

[1] For example, Pampel (2014) shows that the influence of individual socio-economic status on environmental concern is conditional on country-level wealth/development. In lower income countries, socio-economic status is weakly associated with environmental concern, but in high income countries, socio-economic status is strongly associated with environmental concern.

change attitudes should vary across contexts. In wealthy and highly developed countries in Western Europe and North America, left-right political orientation is very important for how citizens think about politics. Political parties are organized along ideological lines connected to economic issues (Budge, et al. 2001). In other contexts though, citizens may think about politics by examining performance or using more fundamental identities, such as religion or ethnicity. In these countries, political parties are not necessarily organized along ideological lines, but instead might be organized to promote regional, ethnic, or religious interests. So the connection between left-right political orientation and opinions on the environment and climate change should be weaker.

In addition, left-right political orientation also has different meanings across contexts. Simply put, I expect those on the right in the rich countries to be generally in favor of expanding the free market, while those on the left be in favor of greater limitations on the economic market. In other words, those on the right seek to protect and expand capitalism, while those on the left attempt to restrict and limit capitalism (Jacques, et al. 2008, McCright and Dunlap 2011, Dunlap 2013). Environmental quality and mitigating the consequences of climate change are public goods. Clean air and water are benefits everyone can enjoy, and rising seas and more violent storms caused by climate change are likely to affect everyone, albeit some individuals could be more affected than others. Those on the left do not believe the economic markets can protect the environment and mitigate the consequences of climate change, because they believe firms have an economic incentive to denigrate the environment and damage the climate. So the left in these rich countries calls for market intervention by governments. For those on the right, they fervently believe the market can address the problems caused by climate change or reject the possibility of consequences to preserve their belief in capitalism.

So it is unsurprising that those on the left and the right are deeply divided on questions of policy regarding the environment and climate change in rich countries such as the United States. Policy determines the way the government intervenes in the market. For example, in the United States, there is a deep partisan and ideological divide on climate change mitigation policies, which require government intervention (Krosnick and MacInnis 2013). How does this left-right divide extend to concern about the environment and climate change in rich countries in Western Europe and North America? The public is likely to align their policy positions with overall issue attitudes, so policy preferences on climate change should match with risk perception. Research in political psychology has found that conservatives are more likely to engage in system justification motivation than liberals, and justifying the capitalist system requires dismissing the threat of climate change (Jost, et al. 2003a, Jost, et al. 2003b, Jost, et al. 2008).[2]

The connection between left-right economic position and concern about the environment and climate change is less clear outside of the Western Europe-North America (and Australia and New Zealand) context. Attitudes toward economic issues might not shape what people think about climate change and the environment. In less wealthy countries, environmentalism should not be as closely tied to an anti-business, anti-capitalism position. For example, environmentalism may be connected to protecting agriculture in more rural societies (Nawrotzki 2012). And in poorer countries, people may be more likely to directly experience environmental degradation (Inglehart 1995, Brulle and Pellow 2006), and this could more influence their attitudes toward the environment. Finally, specifically, in post-communist societies, those who describe themselves as on the left might be pro-business and pro-capitalism, the opposite of the relationship in Western European and North American countries (Sabbagh 2005, Nawrotzki 2012). So in these countries, the left should not be more likely to be concerned about the environment or think climate change is more serious than the right. Instead, it could be the self-identified right sees climate change as more serious than the left or there is no relationship in these societies. Research has found a different the relationship between left-right political orientation and environmentalism is different in post-communist countries.[3] I expect these findings about the varying influence of left-right political orientation to extend to climate change risk perception.

[2] Systems justification theory is similar to dominant social paradigm theory. Individuals who subscribe to the dominant social paradigm have been found to less supportive of environmental protection than those who do not (Dunlap and Van Liere 1984).

[3] Van Hiel and Kossowska (2007) show a negative relationship between identifying with the right and environmentalism in Ukraine, no relationship in Poland, and a substantively strong relationship in Belgium. And Nawrotzki (2012) shows that the that there is a statistically significant difference between the right and the left in

5.3 Hypotheses

The previous sectioned argued left-right political orientation has different meanings and level of salience across countries. I argue this shows that the left-right divide is the primary political cleavage in rich countries, as politics is fought over economic and social policy. But in middle and low income countries, both political cleavages other than the left-right divide are important and the left-right divide has different meanings.

First, if left-right political orientation is more salient in rich countries than in poor countries, then I expect individuals in rich countries to be more likely to identify with left-right political orientation than individuals in poor countries. In contexts in which left-right political orientation does not impact politics, many citizens should not know how to make use of the left-right continuum.

H1: Citizens are more likely to be able to place themselves on the left-right continuum in richer countries than in poorer countries.

Second, if left-right political orientation has a different level of salience to politics across contexts, determined by country-level wealth and income, then its influence concern about climate change should vary across countries. If left-right political orientation is less prevalent in poorer countries, then I expect that left-right political orientation should not influence perceived seriousness of climate change in these contexts. But in richer countries where left-right orientation is more salient to politics, I expect that the left should be more concerned about climate change than the right.

H2: Individuals on the left and individuals on the right are more divided on climate change risk perception in rich and developed countries than in poorer and less developed countries.

The divide between the left and the right should increase as wealth and development increase, and the difference between the left and right should only be statistically significant in rich/developed countries.

Moreover, left-right political orientation has different meanings across contexts. Specifically left-right political orientation might not clearly connect to the environment and climate change in post-

willingness to pay to address environmental problems in countries without a communist history, but the relationship is not statistically different from zero in post-communist countries.

communist countries. Therefore, I do not expect left-right political orientation to be related to climate change risk perception.

H3: In post-communist countries, the left and the right are not divided climate change, while in countries without this experience with communism, the left is more likely to say climate change is serious than the right.

So I expect the left should not be significantly different from the right on perceived dangerousness of climate change in post-communist countries, and in countries which were not part of the communist bloc during the Cold War, the left should be significant different from the right.

5.4 Measurement

There are two dependent variables included this chapter. First, to measure use of left-right political orientation, I capture whether a respondent could place himself or herself on the left-right continuum. Respondents were asked on the WVS: "In political matters, people talk of 'the left' and 'the right'. How would you place your views on this scale, generally speaking". Respondents are coded by whether they could place their views, by simply answering the question, or not, by answering don't know. Second, climate change risk perception was captured by using the question from the WVS used in previous chapters. The WVS asked how serious respondents considered "global warming or the greenhouse effect" with the response categories "not serious at all", "not very serious", "somewhat serious", and "very serious."

There are two important independent variables in this chapter. First, I measure left-right political orientation in the WVS by using self-described political ideology. Respondents were asked to place their views on their on a range from one to 10, with one being on the far left and 10 being on the far right (this measure is also used as the dependent variable for *H1*). The second set of important independent variables captures country-level characteristics. I measure country affluence with the natural logarithm of mean GDP per capita from 2005 to 2009 and whether the country is a member of the Organization of Economic Cooperation and Development (OECD), an association of the wealthiest countries, or not. I also measure a country's level of development with mean Human Development Index (HDI) score from 2005 to 2009.

Finally, I measure whether a country is post-communist, capturing whether the country experienced a transition away from communism after the fall of the Soviet Union or not.

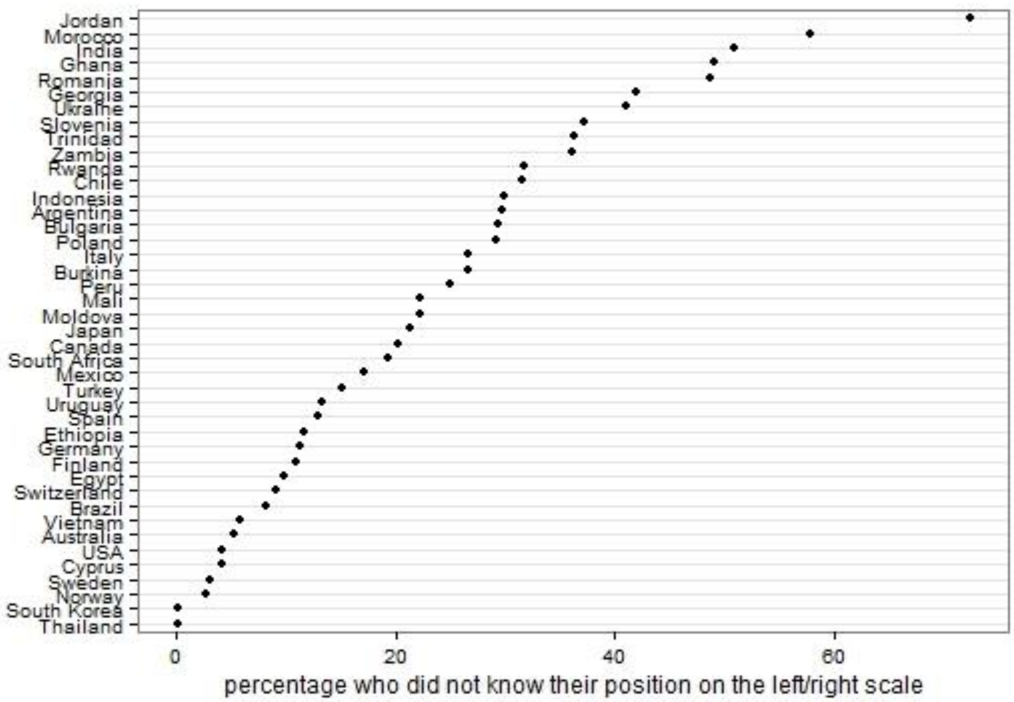
The statistical models also include control variables, including age, gender, level of education, and other possible confounding factors, such as interest in politics, depending on the dependent variable and specification. The model specifications at the individual-level are very similar to those used in Chapter 4. More information on the measurement of variables is available in the Appendix A.

5.5 Use of left-right political orientation across countries

I first test *H1*, which posits that the ability to use the left-right continuum increases with increasing country-level wealth and development. Unsurprisingly, the ability of respondents to place themselves on the left-right continuum varies across countries. Figure 4.1 shows the percentage of people in each country who could not place themselves on the left-right continuum in the World Values Survey (WVS). The WVS asked respondents to place themselves on a left-right range, so those who do not answer the question are coded as being unable to use the left-right continuum. Many individuals across all countries struggle to place themselves on the left-right continuum, as 27 percent of respondents chose "do not know" when asked to place their political ideology across 42 countries.[4] Figure 5.1 also clearly shows the cross-national variation. In only about one-in-four countries are more than 90 percent of respondents able to place themselves on the left-to-right continuum. In this group is the United States, in which only four percent of respondents answered "don't know" when asked for their political ideology. But in 24 of the 42 countries, a majority of countries, less than 80 percent of respondents are able to place themselves. In seven countries, Ukraine, Georgia, Romania, Ghana, India, Morocco, and Jordan, at least 40 percent of respondents were unable to place themselves on the left right continuum. And in India, Morocco, and Jordan, a majority of respondents answer "don't know". It is clear that left-right political orientation in politics is more meaningful to citizens in some countries than citizens in other countries; political ideology is more important in some contexts than others.

[4] In China and Malaysia, respondents were not asked to identify their ideology on the left-to-right continuum, so these countries are unfortunately excluded from much of the analysis.

Figure 5.1: Percentage who do not answer the political left-right continuum question, by country (World Values Survey 2005-2009)



This variation in the percentage of those who did not know their political ideology in each country can be explained by a country's level of wealth and development. I model the individual use of the left-right continuum as a function of demographic variables—age, gender, education, and self-described economic class—and at the country-level, the natural logarithm of GDP per capita or HDI, measures of country-level wealth and development. Since use of the left-right continuum is a binary variable, I use a logistic functional form. The latent variable model is shown in equation 1.

$$(1)\ (use\ of\ left-right\ scale)^{*}{}_{i} \sim N(\alpha_{j[i]} + \textstyle\sum_{k=1}^{k} \beta_k x_{ki}, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00}, \sigma_\alpha^2)$$

The results of the multilevel models are presented in Table 5.1. The findings at the individual-level are not surprising. Less educated individuals, women, members of the lower and working class (compared the middle class, which is the reference category), individuals younger than 39 and 70 and older (compared to 40-49 year olds, the reference category) are significantly less likely to be able to place themselves on the left-right continuum. Those more educated and in the upper class (compared to the middle class) are the groups significant more likely to be able to place themselves on the left-right continuum.

Table 5.1: Random-intercept binary logistic models predicting not using the left-right continuum (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)
Level of education	**-0.1713**	**-0.1711**	**-0.1711**	**-0.1711**
	(0.0143)	(0.0143)	(0.0143)	(0.0143)
Female	**0.4345**	**0.4346**	**0.4346**	**0.4346**
	(0.0397)	(0.0397)	(0.0397)	(0.0397)
Lower class	**0.2798**	**0.2794**	**0.2795**	**0.2794**
	(0.0635)	(0.0635)	(0.0635)	(0.0635)
Working class	**0.1102**	**0.1103**	**0.1104**	**0.1102**
	(0.0481)	(0.0481)	(0.0481)	(0.0481)
Upper class	**-0.2366**	**-0.2365**	**-0.2366**	**-0.2366**
	(0.0493)	(0.0493)	(0.0493)	(0.0493)
Age younger than 30	**0.1688**	**0.1683**	**0.1683**	**0.1684**
	(0.0437)	(0.0438)	(0.0438)	(0.0437)
Age 30-39	**0.1069**	**0.1067**	**0.1067**	**0.1067**
	(0.0366)	(0.0366)	(0.0366)	(0.0366)
Age 50-59	-0.0501	-0.0499	-0.0499	-0.0499
	(0.0439)	(0.0439)	(0.0439)	(0.0439)
Age 60-69	0.0791	0.0797	0.0796	0.0795
	(0.0631)	(0.0631)	(0.0631)	(0.0631)
Age 70 and older	**0.1765**	**0.1772**	**0.1772**	**0.1770**
	(0.0758)	(0.0758)	(0.0758)	(0.0758)
Country-level				
Natural logarithm of mean GDP per capita		**-0.2297**		
		(0.1084)		
Mean HDI			-1.7251	
			(0.9454)	
OECD country				-0.7536
				(0.4392)
Constant	-1.8892	0.1222	-0.6515	-1.5942
	(0.2335)	(0.9882)	(0.6810)	(0.2974)
Variance components				
Country-level standard deviation	**2.0376**	**1.8892**	**1.9353**	**1.8854**
	(0.7845)	(0.7757)	(0.7629)	(0.7891)
Number of respondents	57574	57574	57574	57574
Number of countries	41	41	41	41
AIC	51566	51565	51566	51565

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses with listwise deletion. **Bold** indicates two-tailed $p<0.05$. China, Malaysia, and Mexico not included because of omitted questions in these countries.

The results of most interest are the country-level measures of wealth and development. The country-level variance component is statistically significant in Model 1, which does not include any country-level covariates, showing that there is meaningful variation between countries in the ability to use the left-right continuum, not surprising given the amount of variation shown in Figure 4.1. In Models 2 and 3, which include either natural logarithm of GDP per capita or HDI as a country-level covariate, the country-level variance decreases. The coefficient estimate for the natural logarithm of GDP per capita is negative and statistically significant (two-tailed *p*-value = 0.032). Specifically, an average individual in a country with a GDP per capita of about $1100 had a predicted probability of 24 percent to be unable to use the left-right scale; for the same profile in a country with a GDP per capita of about $36000 the predicted probability was 11 percent.[5] So individuals are significantly more likely to be able to place themselves on the left-right continuum in rich countries than in poor countries, and this difference is substantively meaningful. Even though the estimate for HDI is not statistically significant at the conventional 0.05 alpha, the two-tailed *p*-value of 0.068 suggests that this coefficient estimate is highly unlikely if HDI had no effect.[6] And finally, individuals in OECD countries are about 10 percent less likely to not be able to use the left-right continuum than individuals in non-OECD countries, although this difference is again not statistically significant at the conventional level (95 percent confidence interval: [-0.230, 0.016]). Still, this offers supportive evidence in support of *H1*. Citizens in wealthier are more likely to use the left-right continuum. The findings from this section suggest left-right political orientation is more used and salient in rich countries than poor countries.

5.6 The varying influence of left-right political orientation on climate change risk perception

The previous section shows that the use of left-right continuum varies across countries according to level of wealth and development. I argue previously that this finding should influence the use of left-right political orientation on climate change attitudes. This section shows that influence on left-right political orientation on climate change risk perception is conditional on country-level wealth and development. In poorer countries, left-right political orientation does not predict perceived seriousness of climate change, but in the richest countries, the divide between the left and the right is significant and in

[5] The profile used to calculate the predicted probabilities is a mean educated 40-49 year old female in the middle class.

[6] The null hypothesis of no effect can be rejected in a one tailed test (0.034<0.05). HDI has a modest substantive effect on the use of the left-right range. At HDI 0.65, an average individual had a predicted probability of not being able to use the left-right continuum of about 20 percent; at HDI of 0.9, an average individual has a predicted probability of not being able to use the left-right scale of 13 percent. The same profile is used here as above.

some countries, substantially important. And left-right political orientation does not predict perceived seriousness of climate change in post-communist countries, but left-right political orientation does have a significant association in countries that did not have this experience.

Here, I test *H2* and *H3,* which hypothesize that left-right political orientation only influences concern about climate change in rich countries and countries which are not post-communist. First, I informally test the hypotheses by running regression models predicting saying climate change is a very serious problem, controlling for other possibly explanatory factors and demographics such as age, education, and gender, for each country.[7] Out of 41 countries, in 16 countries, a minority, left-right political orientation is, as expected, a statistically significant and negative predictor of climate change risk perception. In these countries, an individual who places himself or herself on the left is more likely to think climate change is very serious than an individual who places himself or herself on the right. And the overwhelming majority of these countries are wealthy and highly developed. The estimated difference between individuals on the left and those on the right is statistically significant for the nine richest, as measured by mean GDP per capita, and 10 most developed, as measured by mean HDI, countries included in the WVS. These differences are substantially important too. Individuals on the left are about 10 percent more likely than those on the right to consider climate change very serious in Germany, Norway, and Sweden, 13 percent more likely in Canada, 20 percent more likely in Spain, 25 percent more likely in Switzerland, and 48 percent more likely in the United States. In many North American and Western European countries, the public is meaningfully divided on climate change.

Among poorer and less wealthy countries, general left-right political orientation does not predict climate change risk perception in most countries. Climate change is not a left-right political issue in these countries. The loess line of best fit in Figure 5.2 illustrates this nicely. The line is flat and hugs zero for most values of the natural logarithm of mean GDP per capita and mean HDI. This shows that for low and middle income countries, there is no predicted difference between individuals on the left and on the right

[7] Coefficient estimates from multilevel models could be misleading, as the estimate could the result of a few highly influential countries. Individual country models check to make sure the results is consistent with the hypotheses.

in the likelihood of saying climate change is very serious. Only at the highest values of the natural logarithm of GDP per capita and HDI does the loess line increase rapidly, capturing the strong and substantially meaningfully difference between the left and the right among the richest and most developed countries. This informal analysis of the ISSP and WVS provides strong evidence in support of *H2*; general left-right political orientation only influences concern about climate change in affluent and developed countries.

Figure 5.2a: Effect of left-right political orientation on predicting perceived seriousness of climate change across values of natural logarithm of mean GDP per capita, by country (World Values Survey 2005-2009)

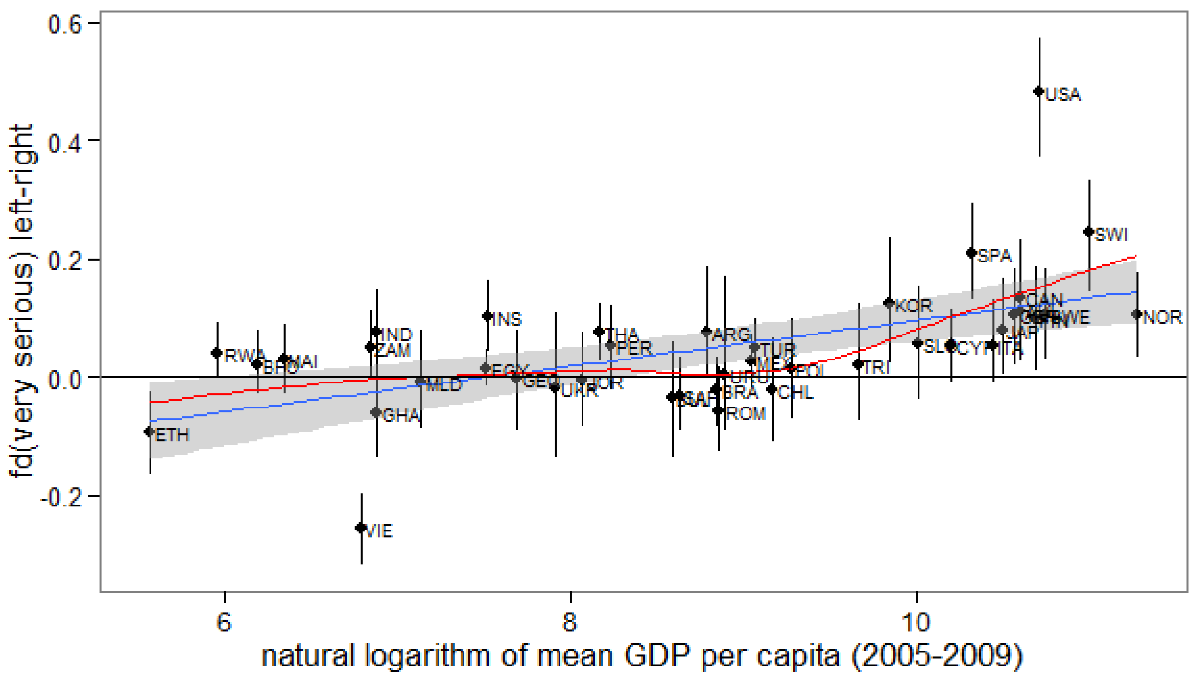
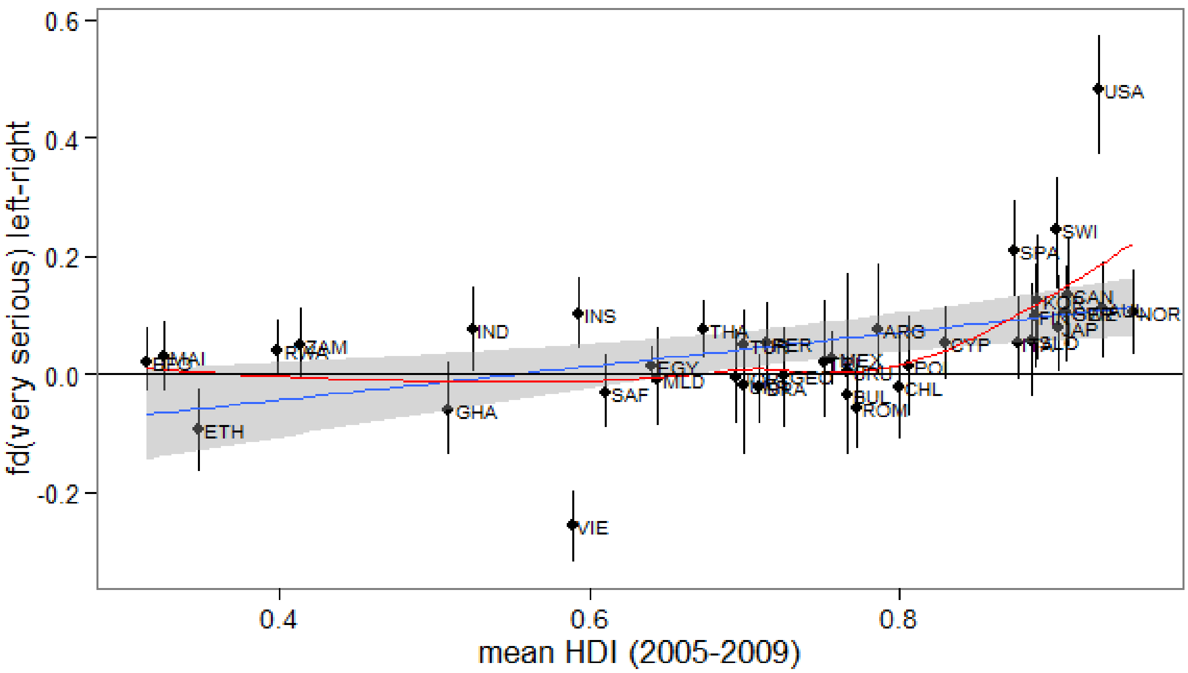


Figure 5.2b: Effect of left-right political ideology on predicting perceived seriousness of climate change across values of mean HDI score, by country (World Values Survey 2005-2009)



Notes: The blue line is the OLS line of best fit and the blue region is its 95 percent confidence interval. The red line is the loess line of best fit. And the vertical error bar is the 95 percent confidence interval for the estimated difference for each country.

I now turn to the multilevel models focusing on the interaction terms to test the hypothesis that left-right political orientation only influences climate change risk perception in wealthy and highly developed countries. The results are shown in Figure 5.3 visually and Table 5.2. The difference between the left and the right in the predicted probability of considering climate change a very serious problem for the world as a whole increases as country-level wealth and development increases. Specifically, country-level wealth and development does not influence climate change risk perception among those on the right. Controlling for competing explanations, an individual on the right has a predicted probability of about 60 percent of considering climate change very serious, regardless where she lives (wealthy or less wealthy country). An individual with the same profile expect with political ideology on the left in a country with a GDP per capita of about $1100 also has a predicted probability of 58 percent of viewing climate change as very serious. So there is not a significant difference between the left and right on perceived seriousness of climate change in poor countries. But an individual on the left in a country with a GDP per capita of

$36000 has a predicted probability of answering that climate change is very serious of 71 percent. In very rich countries, an individual on the left is 13 percent more likely to consider climate change very serious than an individual on the right, controlling for other possible factors and demographics, a statistically significant and substantively important difference. In another way of showing that the relationship between left-right political orientation and climate change risk perception only exists in rich countries, in non-OECD countries, the left is not significantly more likely to consider climate change very serious than the right. But in OECD countries, an individual on the left was 13 percent more likely than an individual on the right with the same profile to consider climate change very serious, a statistically significant difference. These findings show that a substantively important divide between the left and right only exists in rich countries.

In addition, left-right political orientation seems to only influence climate change risk perception in countries without a communist history. In post-communist countries, an individual on the right is actually more two percent more likely to consider climate change very serious than an individual on the left with the same profile, but this estimate is not statistically different from zero. But in countries without such experience with communism, which included a diverse sample of rich and poor countries, a citizen on the left is seven percent more likely to consider climate change very serious, a statistically significant difference, than an individual on the right.[8] The analysis from the WVS supports *H3* and *H5*. The effect of left-right political orientation on perceived seriousness of climate change is not constant across countries. Instead, it is conditioned by development and historical experience.

[8] Considering the large effect political ideology had in the United States in the WVS analysis, as a robustness check, I tested the hypotheses on a sample of 40 countries, excluding the United States. The results are virtually identical; the conditional effect on political ideology of the GDP per capita, HDI, OECD, and post-communist is just slightly weaker. For example, when GDP per capita is set $36,000, the predicted difference between left (ideology=3) and right (ideology=8) in considering climate change very serious is 10 percent instead of 11 percent in the analysis above.

Table 5.2: Random-intercept, random-coefficient ordered logistic models predicting perceived seriousness of climate change (World Values Survey 2005-2009)

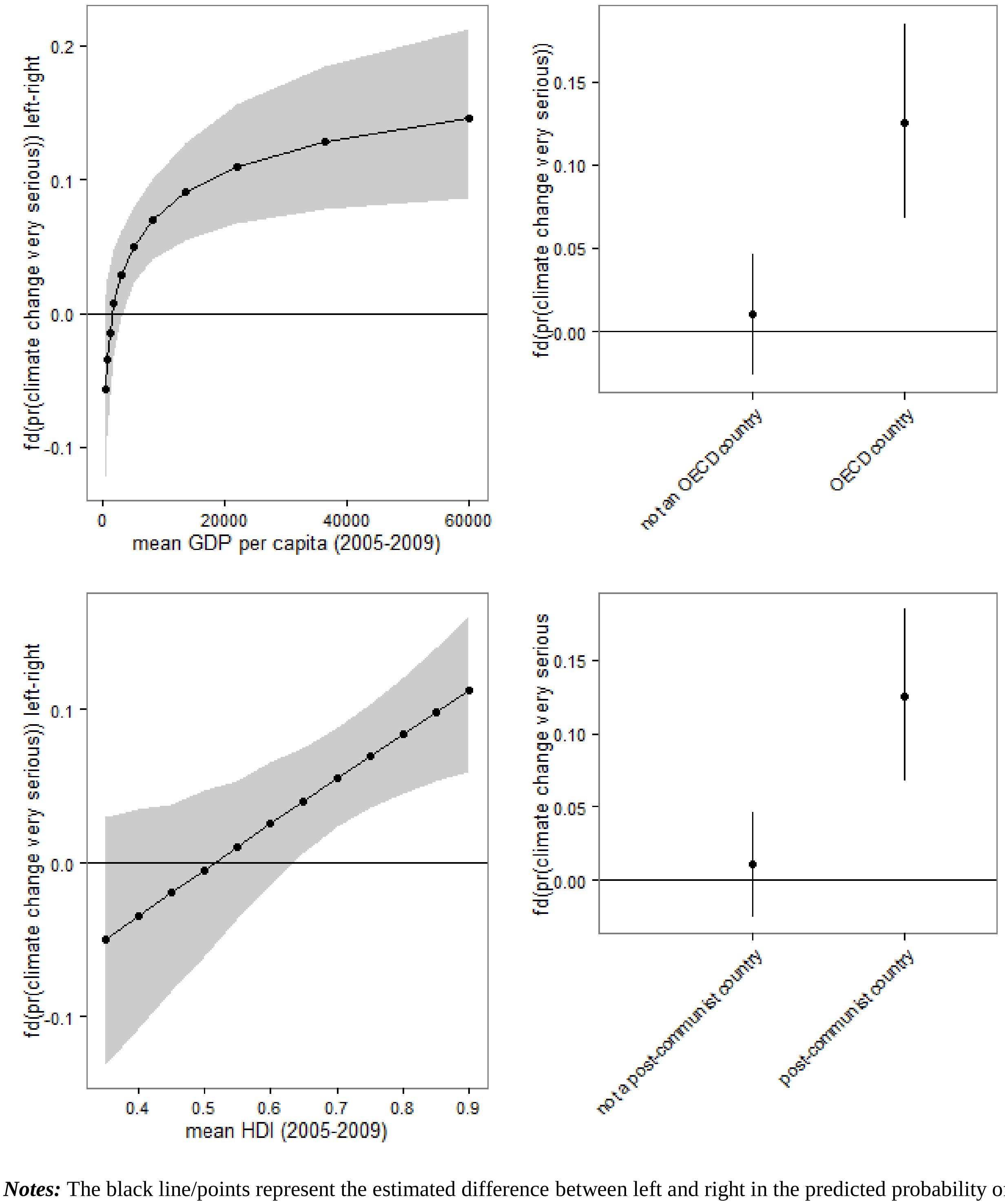
	(1)	(2)	(3)	(4)	(5)	(6)
Political ideology	**-0.0473**	**-0.0518**	**0.2604**	**0.1315**	-0.0088	**-0.0651**
(from left to right)	(0.0126)	(0.0159)	(0.0852)	(0.0611)	(0.0149)	(0.0181)
Post-materialism index	**0.0660**	**0.0539**	**0.0531**	**0.0534**	**0.0531**	**0.0538**
	(0.0221)	(0.0221)	(0.0220)	(0.0220)	(0.0220)	(0.0221)
Interest in politics	**0.0628**	**0.0582**	**0.0577**	**0.0578**	**0.0580**	**0.0583**
	(0.0200)	0.0193	(0.0193)	(0.0193)	(0.0194)	(0.0193)
Level of education	**0.0928**	**0.0932**	**0.0929**	**0.0929**	**0.0930**	**0.0932**
	(0.0140)	(0.0142)	(0.0142)	(0.0142)	(0.0142)	(0.0142)
Attendance of religious services	-0.0240	-0.0194	-0.0191	-0.0191	-0.0192	-0.0195
	(0.0142)	(0.0136)	(0.0136)	(0.0136)	(0.0136)	(0.0137)
Importance of God	**0.0461**	**0.0495**	**0.0499**	**0.0498**	**0.0499**	**0.0494**
	(0.0085)	(0.0088)	(0.0088)	(0.0088)	(0.0088)	(0.0088)
Protestant	-0.1443	-0.1293	-0.1293	-0.1289	-0.1291	-0.1294
	(0.0747)	(0.0691)	(0.0692)	(0.0692)	(0.0692)	(0.0692)
Female	0.0698	0.0623	0.0617	0.0619	0.0618	0.0623
	(0.0358)	(0.0348)	(0.0348)	(0.0348)	(0.0348)	(0.0348)
Age younger than 30	**-0.1180**	**-0.1137**	**-0.1132**	**-0.1133**	**-0.1137**	**-0.1140**
	(0.0461)	(0.0477)	(0.0479)	(0.0479)	(0.0477)	(0.0477)
Age 30-39	-0.0089	-0.0020	-0.0014	-0.0016	-0.0018	-0.0021
	(0.0323)	(0.0332)	(0.0325)	(0.0325)	(0.0324)	(0.0323)
Age 50-59	0.0019	0.0182	0.0177	0.0176	0.0177	0.0186
	(0.0332)	(0.0332)	(0.0332)	(0.0332)	(0.0333)	(0.0333)
Age 60-69	0.0131	0.0191	0.0191	0.0188	0.0191	0.0197
	(0.0465)	(0.0472)	(0.0470)	(0.0469)	(0.0470)	(0.0472)
Age 70 and older	-0.0512	-0.0325	-0.0323	-0.0328	-0.0325	-0.0319
	(0.0479)	(0.0467)	(0.0464)	(0.0464)	(0.0253)	(0.0477)
Country level variables						
Natural log of mean GDP per capita			**0.2758**			
			(0.0799)			
Mean HDI				**2.0327**		
				(0.8421)		
OECD country					**0.8074**	
					(0.2530)	
Post-communist country						**-0.5273**
						(0.2340)
Interaction terms						
Political ideology X Natural log of GDP			**-0.0356**			
			(0.0098)			
Political ideology X Mean HDI				**-0.2549**		
				(0.0855)		
Political ideology X OECD country					**-0.1039**	
					(0.0296)	
Political ideology X Post-communist						**0.0799**
						(0.0208)
Not serious at all | Not very serious	-4.3304	-4.3306	-1.9116	-2.8664	-3.9952	-4.4195
	(0.2114)	(0.2158)	(0.7445)	(0.6698)	(0.23594)	(0.2292)

Table 5.2 (cont'd)

Not very serious | somewhat serious	-2.5558	-2.5469	-0.1281	-1.0829	-2.2117	-2.6359
	(0.1579)	(0.1713)	(0.7534)	(0.6755)	(0.2029)	(0.1909)
Somewhat serious | Very serious	-0.6118	-0.5894	1.8293	0.8745	-0.2543	-0.6784
	(0.1236)	(0.1466)	(0.7544)	(0.6709)	(0.1889)	(0.1662)
Country-level variance	**0.4075**	**0.7879**	**0.5892**	**0.6519**	**0.6148**	**0.7468**
	(0.0997)	(0.2265)	(0.1737)	(0.2027)	(0.1774)	(0.2295)
Political ideology variance		**0.0092**	**0.0060**	**0.0071**	**0.0065**	**0.0083**
		(0.0044)	(0.0028)	(0.0033)	(0.0032)	(0.0043)
Number of respondents	39973	39973	39973	39973	39973	39973
Number of countries	41	41	41	41	41	41
AIC	71554	71331	71318	71325	71321	71331

***Notes*:** Cell entries are ordered logistic regression coefficients with standard error clustered by country in parentheses with list wise deletion. **Bold** indicates two-tailed $p<0.05$. China, Malaysia, and Mexico are not included because of omitted questions in these countries.

Figure 5.3: Conditional effect of left-right political ideology on predicting considering climate change very serious across values of GDP per capita, HDI, OECD, and post-communism (World Values Survey 2005-2009)



Notes: The black line/points represent the estimated difference between left and right in the predicted probability of considering climate change very serious, and grey area/error bars represent the 95 percent confidence interval of the estimate. The figures were produced using models presented in Appendix D. Specifically, left is defined as political ideology=3 and right is defined as political ideology=8. Post-materialism index, interest in politics, level of education, attendance of religious services, and importance of God at set to their overall means, and every other

Figure 5.3 (cont'd)
variable in the model is set to zero except for female, which is set to one. Respondents were asked, "Tell me how serious you consider for the world as a whole global warming or the greenhouse effect?" Response categories: not serious at all; not very serious; somewhat serious; very serious.

5.7 Discussion and conclusion

This chapter builds on the literature on comparative public opinion on climate change with focus on how the influence of individual characteristics vary by country factors (Gelissen 2007, Sandvik 2008, Franzen and Meyer 2010, Brechin and Bhandari 2011, Kvaløy, et al. 2012, Nawrotzki 2012, Franzen and Vogl 2013). The previous chapter shows that left-right political orientation predicts perceived seriousness of climate change on average across countries by this finding masked important variation in both the size of this influence across countries. Controlling for competing explanations, I show in this chapter that the difference between the left and the right on the perceived seriousness of climate change is positive and statistically significant in only a minority of countries across cross-national surveys. But in some countries, such as Canada and Switzerland, the left is substantively and significantly more inclined to see climate change as a serious problem than the right.

What explains this variation in the influence of left-right political orientation across countries? Using cross-level interaction models, I find that country-level wealth/development and historical experience with communism are two important contextual factors. I show that in poor and less developed countries, the difference in concern between the left and right is not statistically different from zero, but in very rich countries, the left is significantly likely to consider climate change serious than the right. And I also show that in post-communist countries, the difference in perceived seriousness is not statistically significant, while in the diverse group of countries without historical experience with communism, the left is significantly more inclined to say climate change is serious than the right. These findings illustrate that in the very rich countries of Western Europe and North America, the left and right seem to be divided on climate change.

For policymakers and activists who support national and international policy to mitigate the consequences of climate change and protect the environment, this chapter offers both a positive and a negative. The good news is that in many less wealthy and post-communist countries, climate change is not closely tied to how individuals perceive their political ideology. In many of these countries, citizens generally express that climate change is serious. But it is open to debate just how deep concern about these issues is in these societies. Climate change might not be a front-burning issue in this context.

The bad news is that in many of the very rich countries, there is a clear political divide on climate change. The right in these countries is far less likely to consider climate change serious than the left. In many Western European and North American countries, the environment and climate change has become politically politicized. These rich countries not only need to make the biggest policy and behavioral changes, considering they are responsible for an important amount of global carbon emissions, but they are also necessary leaders for an international climate agreement. Yet in these rich countries, the publics seem far from unified in support for such policy action, and the lack of concern on the right is a major obstacle.

This chapter introduced another puzzle though. The divide between the left and right is great in many wealthy countries, but as shown in Figure 5.2, this divide is far greater in the United States. The United States stands out as an outlier; the public is far more polarized on climate change in the United States. Why? Chapter 6 tackles this question.

Chapter 6: Why is the American public far more polarized on climate change than other wealthy countries?

5.1 Introduction

In early January 2014, in the midst of extremely cold weather throughout the United States, Senator James Inhofe, a conservative from the state of Oklahoma, took to the Senate floor to give a speech in which he called climate change "laughable" This was hardly the first time that Inhofe, America's most prominent climate change denier, made news. In 2012, Inhofe published *The Greatest Hoax: How the Global Warming Conspiracy Threatens Your Future.* And In 2010, after the Climategate scandal, he called for criminal investigations of climate scientist (Nature 2010). And in 2003, as the chair of the U.S. Senate Committee on the Environment and Public Works, he asked if climate change might be "the greatest hoax ever perpetrated against the American people?" (Begley 2007).[1]

Inhofe, however, is hardly alone among conservative elites in Republican Party in the United States to deny climate change. During the 2012 Republican presidential primary campaign, Rick Santorum called climate change a conspiracy theory, claiming that climate change was "an absolute travesty of scientific research that was motivated by those who, in my opinion, saw this as an opportunity to create a panic and a crisis for government to be able to step in and even more greatly control your life… I for one never bought the hoax" (Hooper 2012). Out of the entire Republican primary field in 2012, only Jon Huntsman, the moderate, accepted climate change, and he was never a competitive candidate.[2]

Politicians are not the only members of the conservative elite to speak out against global warming in the United States. The conservative media is also full of influential individuals who are climate change deniers. In April 2013, Rush Limbaugh, the most influential conservative radio host in the United States, called climate change a "political hoax", claiming that carbon emissions "may actually be making things

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[1] Inhofe was appointed as Chair of Environment and Public Works Committee in the United States Senate again in January 2015.

[2] During the campaign, in August 2011, Huntsman took to twitter to proclaim: "I believe in evolution and trust scientists on global warming. Call me crazy" (Lawrence 2011).

cooler, not warmer" (Robbins 2014). And Fox News and the *Wall Street Journal*, both owned by Rupert Murdoch and News Corp, have become prominent outlets for climate change deniers to attack climate science to create uncertainty (Robbins 2014).

The conservative "denial machine" has become a crucial part of the so-called climate change debate in the United States (Begley 2007). How much does this matter to mass public opinion though? How does the conservative and Republican political and media elite affect mass public opinion on climate change in the United States? The previous chapter in this dissertation showed that individuals on the left are more worriedabout the environment in general and climate change specifically than individuals on the right in rich countries. And previous research on public opinion in the United States has shown that liberals and Democrats are more concerned about environmental problems (Dunlap, et al. 2001, Hamilton 2011; McCright 2011, McCright and Dunlap 2011) and climate change (McCright and Dunlap 2011, Guber 2013) than conservatives and Republicans. Is the left-right divide on the environment and climate change in the United States just typical of rich and developed countries? Or is it exceptional?

This chapter shows that both the elite and mass-level left-right divide are far greater in the United States than the elite and massive divides are in other wealthy countries. First, it shows that the "denial machine" is far stronger in the United States than anywhere else in the world. Elites are far more polarized on climate change in the United States than they are in other countries or even on other environmental problems. Second, the consequences of this elite polarization for mass public opinion in the United States are explored, motivating a series of hypotheses. Third, I test these hypotheses by situating the relationship between left-right political orientation and climate change risk perception in the United States in the comparative context. The analysis shows that the ideological polarization of public opinion on climate change in the United States is truly unique. Left-right political orientation has a much stronger effect on the perceived dangerousness of climate change in the United States than its effect in other countries. In addition, in the United States, among liberals, increasing political knowledge and interest in politics increases perceived seriousness of climate change, but among conservatives, increasing political knowledge and interest in politics decreases perceived seriousness. Americans not interested in politics are not divided on climate change, but the most interested Americans are extremely divided. In no wealthy country does knowledge and interest have this conditional effect on left-right political orientation. Political ideology impacts public opinion in the United States unlike anywhere else in the world, a finding that can be attributed to America's political and media elites. Americans seem to be turning to ideologically similar elites on climate change.

6.2 The elites: United States and the rest of the world

In 2010, then British Foreign Secretary William Hague declared in a speech in New York City, "Climate change is perhaps the 21st century's biggest foreign policy challenge. An effective response underpins our security and prosperity" (Brownstein 2010). Hague is a prominent leader in the British conservative party. A similar comment from a member of the conservative political elite in the United States seems almost unthinkable. As the journalist Ronald Brownstein wrote in 2010, "Republicans in this country are coalescing around a uniquely dismissive position on climate change. The GOP is stampeding toward an absolutist rejection of climate science that *appears unmatched* among major political parties around the globe, even conservative ones" (emphasis mine). Eileen Claussen, at the time the president of the Pew Center on Global Climate Change (now the Center for Climate and Energy Solutions) told Browstein of the Republicans that there is "*no party-wide view like this anywhere in the world* that I am aware of" (emphasis mine). There are a few other countries, such as the United Kingdom and Canada, where denialism is part of the climate change debate. In the U.S., political elites are vastly more polarized on climate change than in any other country in the world, including other rich countries. Although there is no clear quantitative evidence to support this proposition, this section supports this argument through thorough deep anecdotal evidence from previous research and media reports.

The "denial machine" (Begley 2007) in the United States made up of a variety of different groups, including fossil fuel corporations, conservative think tanks, politicians, media, and contrarian scientists (Dunlap and McCright 2011). Social scientists (McCright and Dunlap 2003, Dunlap and McCright 2011, Dunlap 2013, Dunlap and Jacques 2013, Elsasser and Dunlap 2013) and journalists (Mooney 2005, Begley 2007, Klein 2011) help us better understand how the denial machine works, emphasizing its extremely close connection with conservative and Republican political elites. The fossil fuel industry, including prominent groups such as Exxon Mobil and American Petroleum Institute, corporations represented by the U.S. Chamber of Commerce, and conservative foundations, like the multitude of groups run by the Koch family, give money to conservative think tanks to attack climate science. Conservative think tanks, such as the Heritage Foundation and Heartland Institute, then support this work by hiring contrarian scientists to lead studies, which invariably question climate science (Dunlap and McCright 2011). Analysis shows that studies with question or refute climate science are almost exclusively funded by conservative think tanks (Dunlap and McCright 2011). Conservative think tanks also publicize their work in the media and distribute it in conservative media, thus making it accessible to the public.

Contrarian scientists use the complexities of climate science as a way of creating doubt that climate change is both the result of human activity and harmful for the environment. The strategy employed by climate change deniers is similar to the one used in the middle of the twentieth century after scientists discovered the major health risks posed by tobacco: generate uncertainty (Oreskes and Conway 2010). To create uncertainty, climate change skeptics use contrarian scientists to attack scientists and their work (McCright and Dunlap 2003, Dunlap and McCright 2011). For example, the denial machine used the supposed "Climategate" scandal, in which they accused scientists of falsifying their research on the basis of emails, to manufacture uncertainty. The goal of this work is to convince the policymakers and the public that a scientific consensus on climate change does not exist.

Actors who are part of the denial machine share a strong commitment to conservative political ideology (Dunlap and McCright 2011). Dunlap and McCright (2011) argue conservative elites see merely acknowledging climate change as real as a major threat to capitalism. Any policy response to climate change would require increasing government regulations. Denial machine actors came together to "combat the threat posed by climate change—not as an ecological problem but as a problem for unbridled economic growth" (Dunlap and McCright 2011).

How could the conservative elite denial machine reach mass public opinion? To reach conservatives in the public, the denial machine relies on conservative media and politicians to spread the message. In addition to Rush Limbaugh, whose radio show reaches millions of Americans each day, the denial machine relies on *Fox News* and the *Wall Street Journal*, both owned by Rupert Murdoch.[3] The Wall Street Journal opinion and editorial pages have become forums for contrarian scientists to attack climate change and create doubt. These op-eds and editorials are not used to present new scientific research, but instead to attack research done by mainstream climate scientists. For example, immediately before the release of the United Nations' Intergovernmental Report on Climate Change fifth assessment report in late 2013, Matt Ridley, who does not have any background in climate science, wrote an op-ed in the *Wall Street Journal* claiming that research "points to the very real possibility that, over the next several generations, the overall effect of climate change will be positive for humankind and the planet." He argues that a warming of two degrees Celsius would results in positive economic and environmental externalities. Climate scientists disagree with him and accuse him of misreading their work.

Ridley might not be a household name, but George Will and Charles Krauthammer, two prominent conservative columnists, are well-known because their syndicated columns are widely circulated in newspapers around the county. And both are committed climate change deniers. Both have compared climate science to a religion, claiming that climate change is a progressive plot with the aim of restricting the freedoms of Americans (Dickinson 2010). In 2010, in the midst of the supposed Climategate scandal, Will described climate science as "a tissue of assertions impervious to evidence, assertions that everything, including a historic blizzard, supposedly confirms and nothing, not even the absence of warming, can falsify" (2010).

In news stories about climate change, the viewpoints of the denial machine are often included in an attempt to create supposed balance (Boykoff and Boykoff 2004, Boykoff 2011, 2013). The denial

[3] Phil Plait, a journalist for *Slate* magazine, probably puts this best: "Here's a simple quiz: How do you know when you're about to read a forehead slappingly silly article about climate change? Check the venue: Is it in the *Daily Mail*, the *Wall Street Journal*, the *Financial Post*, and/or anything owned by Rupert Murdoch and News Corp? If yes, then yes. Chances are what you are about to read only comes within a glancing blow of reality."

machine broadly and contrarian scientists specifically are vastly overrepresented in conservative media outlets. For example, in reaction to the recent IPCC, one report showed that 50 percent of those quoted in the *Wall Street Journal* were “doubters” (Greenberg, et al. 2013). This compared with 29 percent in the *Los Angeles Times*, 17 percent in the *Washington Post*, and 12 percent in Bloomberg News. The *New York Times*, Associated Press, and Reuters did not quote any climate change deniers over this period.

There is no media outlet, however, that plays a more prominent role in the denial machine than *Fox News*. Content analyses have shown that *Fox News* covers issues and events, like the Iraq War and 2008 presidential election in a way that is far more supportive of conservative viewpoints than other news networks, such as CNN and MSNBC (Aday, et al. 2005, "The Color of News: How Different Media Have Covered the General Election" 2008). On climate change specifically, Fox News presdents news coverage that emphasizes the lack of consensus and uncertainty on climate change, while *CNN* has presented coverage tending to emphasize that climate change is real and happening (Feldman, et al. 2012). The anecdotal evidence of *Fox News'* climate change denial is strong. For example, one Fox News anchor claimed in 2013 of “an emerging scientific consensus that we may be in for a period of global cooling caused not by greenhouse gases but by fluctuations in solar energy—sun spots” (Gertz 2013). And prominent *Fox News* political commentators follow. In 2013, Sean Hannity proclaimed that the world was headed into a “prolonged period of global cooling” (Robbins 2014). In the study discussed above, 69 percent of guests on *Fox News* are identified “doubters”, compared with no denial coverage on CNN. Of the *Fox News* guests, 73 percent have no background in climate science (Greenberg, et al. 2013).

Conservative and Republican politicians, sometimes by joining *Fox News* as guests or being quoted in the conservative media, also spread the message of uncertainty about climate change. Inhofe and Santorum may be extreme examples, but most conservative politicians in Washington are climate deniers. The liberal think tank Center for American Progress tracked climate change denialism among members of the 113th U.S. Congress using public statements (Germain, et al. 2013). They found that 58 percent of the Republican caucus rejected climate science. In 2011, the *National Journal* attempted to survey every Republican senator and representative in Congress. Of the 65 who responded on the record, 19 said that a “significant amount” of climate change was the result of human activity, 13 stated climate change is a not causing the planet to warm, and five responded that climate change was not the result of human activity (Davenport 2011). In January 2015, only five out of 54 Republicans voted yes in a sense of the US Senate that climate change is real and human activity contributes significantly to it, while every Democrat voted yes (Davenport 2015).[4] For Republican senators and representatives, denying climate change is very common.[5]

Yet climate change denialism seems like an even more dominant position among the Republican and conservative elite because the climate change deniers are the most eager to talk about it, while those not in the denial camp are silent. In the 2011 *National Journal* survey of Republican senators and congressman, most were unwilling to talk about climate change. One Republican staffer said, “It’s not a conversation senators feel comfortable having” (Davenport 2011). John Boehner, the Speaker of the House and leading Republican in Congress, did not respond, with the reporter stating that “his [Boehner’s] advisers fear that taking a clear position on climate change could crack the caucus in two and stop the cash flow from the biggest campaign money machines” (Davenport 2011).[6]

The climate change deniers are extremely vocal in their attacks on climate science. In the same article, Inhofe sought out reporters multiple times to make sure his positions on climate change were noted. When Darrell Issa, a powerful conservative representative, was asked if he thought climate change was causing the planet to become warmer, he said, “you mean, the global cooling that’s been going on for

[4] In a different vote, 15 out of 54 Republicans voted yes that climate change is real and human activity contributes “some” to it (Davenport 2015).

[5] In a survey of members of Congress in 2006 by the National Journal, called the Washington Insiders polls, 95 percent of Democrats agreed that man-made climate change is a proven fact, while only 23 percent of Republicans agreed. In 2007, the gap between Republicans and Democrats widened, with 98 percent of Democrats saying that warming temperatures are the result of human activity compared to only 13 percent of Republicans. This was another survey of senators and representatives in which most Republicans in Congress did not participate.

[6] The fossil fuel industry and business interests have long provided crucial campaign funding to Republican Party politicians in the United States. Between 1998 and 2010, the fossil fuel industry gave more than $200 million to Republicans, about 75 percent of its total contributions (Davenport 2011). And in the 2010 elections, business interests known to question climate science, such as the U.S. Chamber of Commerce, spent $105 million. Conservative politicians have clear financial interests to deny and doubt climate change.

the last 10 years, according to scientists? The science has just said we've had 10 years of no warming" (Davenport 2011). This constant noise from the conservative media and conservative politicians makes the elite conservative position clear on climate change in the United States: doubt or denial of the science, no or little concern about possible consequences, and a rejection of mitigation policies. Conservative and liberal political elites are clearly polarized in the United States, and this sends a clear signal to the mass public.

Are elites as divided in other countries on climate change by ideology and party? On this question, there is little research, but the answer seems to be no. The climate change denial machine is still uniquely American. Still, U.S. conservatives are spreading their denial machine. to other countries, and there is evidence of some possible elite polarization in other countries. According to Dunlap and McCright (2011), climate change denialism is strongest in the United Kingdom, Canada, and Australia, all countries that have strong free-market conservative parties and active conservative think tanks. These are also Anglophone countries, so the denial message from the U.S. does not have to overcome the language barrier. In Canada and Australia, the fossil fuel industry has also helped promote climate change denialism. As for the rest of the world, conservative think tanks are taking advantage of their international network to spread their message. Still, climate change denialism is a very recent phenomenon outside the United States, so it is unclear how divided elites are outside the United States.[7] Beyond the U.S., UK, Canada, and Australia, the denial machine is extremely weak or does not exist, so political elites may not be divided on climate change.

Recent research also shows that climate change denialism is more prominent in the U.S. media than in other similar countries. Boykoff (2011) compares the United States to the United Kingdom, finding that climate change doubt and denial is far more common in the United States. Painter and Ashe (2012) in a media analysis of Brazil, China, France, India, the UK, and U.S., finds that climate change

[7] McCright and Dunlap (2011: 156) warn of the consequences of the international efforts of conservative think tanks: "We are witnessing the globalization of organized climate change denial, and this does not bode well for the future of climate science and especially for effective international action and policy making to deal with the reality of climate change." It could be interesting to track the effects of this effort on elite and mass public opinion on climate change around the world in the future.

denialism is limited to the UK and United States. Challenges in the media to a policy response to climate change are also limited UK and United States.

This section shows that climate change denialism is far more prevalent in the United States than in other countries. This denial machine has helped create elite polarization in the United States. The conservative media and politicians push a clear message, contrary to the actual scientific research, that climate science is uncertain. In some other wealthy countries, such as the United Kingdom, Canada, and Australia, there evidence of a nascent climate change denial machine. In the rest of the world, this climate change denial machine does not exist. This section has established there is cross-national variation in elite opinion on climate change. The next section introduces hypotheses for the consequences of this variation in elite polarization on mass public opinion across countries.

6.3 Hypotheses

The previous section argues that political and media elites are far more divided in the United States than in similar countries. If elites influence public opinion on climate change, then there should be substantial difference between the United States and these other countries in the effect of left-right political orientation on climate change attitudes. So I should expect mass public opinion on climate change to be uniquely polarized in the United States, reflecting elite ideological polarization. And in other rich countries, left-right political orientation should have a much weaker effect on climate change opinions.

H1: Left-right political orientation is more strongly related to climate change risk perception in the United States than in other rich countries.

It is also possible that in a few other countries, such as the UK, Australia, and Canada, with nascent denial machines on the right, political ideology has a substantively meaningful impact on climate change public opinion. The association in these countries should be weaker than in the United States though, because the elite polarization is not nearly as strong in these countries.

Second, as discussed above, even when elite polarization exists on an issue, not all citizens pick up on and use the cue. Only politically engaged citizens are aware of the elite divisions, so only these citizens can use these elite divisions as an information shortcut to form their opinions on climate change. In the presence of elite political polarization on an issue, political knowledge and awareness should have a divergent impact on the left and right. Elites are polarized on climate change in the United States. So in this specific context, among liberals, political awareness and knowledge should concern and probability of accepting climate science, while for those on the right, political awareness and interest should decrease concern and the probability of accepting climate science. This interactive hypothesis can be stated as follows:

H2: In the United States, for liberals, political engagement is positively related to concern about climate change and the probability of agreeing with climate science, while for conservatives, political engagement is negatively related to concern about climate change and the probability of agreeing with climate science.

Third, this conditional effect of political engagement on left-right political orientation should be specific to public opinion in the United States on climate change. In other wealthy countries, I do not expect this conditional relationship because political elites in these rich countries are not divided on climate change, so politically engaged citizens of these countries cannot use elite polarization as a cue.

H3: The conditional relationship between political engagement and left-right political orientation, in which interest in politics is positively related to perceived seriousness of climate change for the left and interest in politics is negatively related to perceived seriousness for the right, is unique to the United States. In other rich countries, this conditional relationship between political engagement and left-right political orientation on perceived seriousness of climate change does not exist.

These three hypotheses, when taken together, all test the theory that mass polarization reflecting elite polarization is unique to the United States. By drawing on numerous public opinion surveys, including just the United States and many additional countries it is possible to provide evidence to support or refute the argument that many Americans use elite opinion as a cue on climate change.

6.4 Data and methodology

The hypotheses propose a distinctive explanation for public opinion about climate change in the United States. The factors that explain public opinion in the United States on climate change are different from other countries and other environmental issues. In order to test these hypotheses, it is necessary to compare the United States to other countries while controlling for as many competing explanations as possible. The previous chapter showed that left-right political orientation mattered in mostly rich countries. Therefore, I compare the United States to other rich countries, so this chapter focuses on only OECD countries. By comparing the United States to other OECD countries, many contextual factors, like wealth, development, and level of democracy, can be held relatively constant. An important contextual difference across countries is the level of elite polarization on climate change. Although this important factor cannot be precisely measured, the United States has much stronger and clearer elite polarization on climate change than other OECD countries.

I do not rely on multilevel modeling here. Work on cross-national public opinion, in which the hypotheses proposed additive relationships across countries (random intercept models) or conditional relationships across countries (cross-level interaction models) use multilevel modeling. Here the factor—elite opinion—that shapes public opinion in the United States is different from other countries. Multilevel modeling borrows information across groups, yet to test these hypotheses, I do not want to borrow information, as the contexts are different. So to avoid borrowing information, I must produce estimates of relationships each country by estimating a statistical model for each country. I can then compare these effects across OECD countries to see how similar or different the effect for the United States is compared to other countries. This chapter draws from the American National Elections Studies (ANES) from 2008 and 2012 to test *H2* and the World Values Survey to test *H1* and *H3*.

6.5 The effect of left-right political orientation on concern about climate change risk perception

Liberals and conservatives are polarized on climate change in the United States, but does a similar level of polarization exist in other wealthy countries? I argue in *H1* that left-right political orientation has a much stronger effect in the United States than other rich countries. To explore this question and test *H1*, I estimated ordered logistic models predicting climate change risk perception across 17 OECD countries while controlling for other competing explanations and demographic factors using the WVS. The results show that left-right political orientation has a much stronger influence on climate change risk perception in the United States than in other rich countries. Americans are far more ideologically polarized than the publics in other OECD countries.

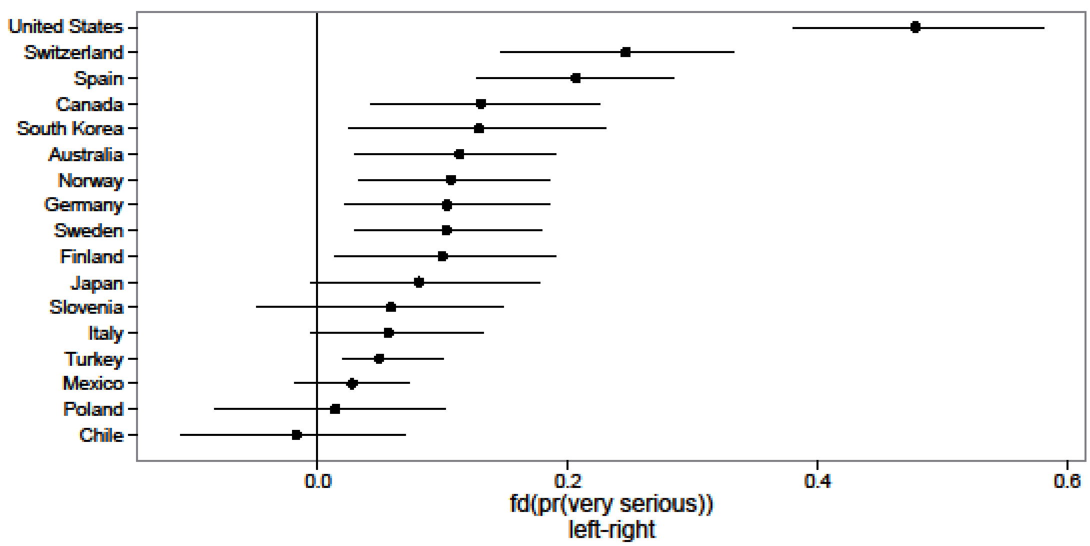
The relationship between left-right political orientation and climate change risk perception is much stronger in the United States than in other wealthy countries. Figure 6.1 shows the predicted difference between an individual on the left (political ideology=3) and right (political ideology=8) in the probability of considering climate change “very serious” for OECD countries in the WVS. Once again, the effect of left-right political orientation on climate change risk perception is much stronger in the United States than in other wealthy and developed countries. An American on the left has a predicted probability of about 76 percent of considering climate change a very serious problem. An American on the right with the same profile has a predicted probability of just 28 percent of considering climate change a very serious problem. This predicted 48 percent difference is about double the size of any other OECD country controlling for competing explanations and demographic factors. This predicted difference is 26 percent in Switzerland and 20 percent in Spain, the countries in which left-right political orientation had the next strongest effects.[8]

At the other end of climate change risk perception, conservatives in the United States are far more likely to think climate change is not serious than conservatives in other OECD countries. An American on the right is predicted to have a 10 percent probability of considering climate change “not serious at all”. The next highest predicted probability for an individual on the right considering climate change “not

[8] The left-right divide in Switzerland is most like the one in the United States. Specifically, a Swiss liberal has a predicted probability of considering climate change very serious of 62 percent, while a Swiss conservative is predicted to be 37 percent likely to consider climate change very serious. Still, Swiss a conservative is about 10 percent more likely to call climate change very serious than American conservatives. In Spain, citizens likely to call climate change a serious problem regardless of their self-described left-right orientation. An individual on the right is predicted to be about 64 percent likely to consider climate change very serious. And Spaniards on the left are overwhelmingly likely to view climate change as very serious, similar to the United States. A liberal is 85 percent likely to consider climate change very serious.

serious at all" is Switzerland at 2.5 percent. Moreover, an American conservative is 22 percent likely to consider climate change not very serious, another response category that reflects a lack of concern about climate change. A Swiss conservative is about 14 percent likely to say climate change is not very serious. And in the rest of the OECD countries, the predicted probability for each of these countries for a conservative viewing climate change as not very serious is less than six percent.[9]

Figure 6.1: Effect of left-right political ideology on predicting considering climate change very serious, by OECD country (World Values Survey 2005-2009)



Notes: The first difference is the difference in probability of considering climate change very serious between left political ideology (ideology=3) and right political ideology (ideology=8), for 40-49 year old, non-Protestant females holding other variables at their overall mean for OECD countries. Statistical models used to produce the first differences are presented in Appendix D.

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[9] The above discussion is based on ordered logistic models predicting concern about climate change, controlling for competing factors and demographic explanations. These models are presented in the Appendix D. I also looked at relationship between left-right political orientation and climate change risk perception directly by not controlling for competing explanations. In the United States, 58 percent of those on the right (ideology=7-10) call climate change not very serious or not serious at all, by far the largest percentage of OECD countries (and all countries). Just 12 percent of those on the left (ideology=1-4) consider climate change not very serious or not serious at all. This 46 percent difference between those on the left and those on the right in the United States is the largest in OECD countries (and all countries included in the WVS). The next largest difference between the left and right is in Switzerland.

Finally, I also estimated linear models, instead of ordered models predicted perceived seriousness of climate change. The coefficient estimate for the United States is about 2.5 stronger that the next largest estimate for Switzerland. The linear models are presented in Appendix D. So analyzing the direct relationship and collapsing categories to measure left-right political orientation produces nearly identical results: Americans are far more ideologically divided on climate change than citizens in other rich countries.

In addition, I separately estimated models predicting perceived seriousness of climate change using the Pew Global Attitudes from 2007-2010 for the United States, Germany, Great Britain, France, and Spain. In all four years self-described political ideology has its strongest predictive effect in the U.S..

The above analysis shows that left-right political orientation has a particularly strong influence on climate change risk perception in the United States compared to other wealthy countries. Americans are comparatively more polarized in the United States. *H1* is supported; the evidence suggests that political polarization is distinctly strong in the United States and could be aligned to elite opinion.

6.6 The conditional effect of political knowledge in the United States

If citizens are following ideologically similar elites in the United States on climate change, I expect to also a conditional relationship between left-right political orientation and political knowledge and awareness. As hypothesized in *H2,* in the United States for those on the left, I expect that concern about climate change and belief in climate science to increase as engagement with politics increases, and for those on the right, I expect concern about climate change and belief in climate change to decrease as political knowledge increases. I test this hypothesis using survey data just from the United States, specifically the 2008 ANES and 2012 ANES. I measure political engagement using a measure of political knowledge. Specifically I measure the number of questions a respondent can answer about basic political facts, such as the number of terms a president can serve for and the number of years in a senator's term. This direct measure of knowledge of basic political facts is used throughout the American public opinion literature as a measure of how closely citizens follow politics in the United States (Zaller 1992). I expect citizens who closely follow politics to be more aware of elite opinions, and therefore more able to use elite cues to form opinions and answer survey questions.

I find very strong evidence supporting *H2* in both the 2008 ANES and 2012 ANES using many dependent variables to measure opinions on climate change. Across questions measuring belief in climate change and concern about climate change, political knowledge has a positive correlation for liberals and a negative correlation for conservatives in the United States. The results of these models are shown in Figure 6.2. First, in the May 2008 ANES wave, respondents were asked about their level of concern about climate change, which was measured from zero to one, with zero meaning "totally unconcerned" and one meaning "very concerned". For liberals, as political knowledge increases, so does concern about climate change. An average American who describes himself or herself as "somewhat liberal" who answers all six political knowledge questions correctly is predicted to be 0.10 more concerned than someone who does not answer a single question correctly. For conservatives, concern about climate change decreases as political knowledge increases. A "somewhat conservative" American who answers all six questions correctly was predicted to be 0.14 less concerned than an individual with the same profile who answers all six questions incorrectly.[10]

Next, I look at the conditional effect of political information on three measures of belief in climate change in the 2008 ANES and 2012 ANES. The results are virtually identical those presented using concern about climate change above; political knowledge has a positive effect in belief in climate change for liberals and a negative effect for conservatives. First, in the May 2008 ANES wave, respondents were asked for the level of agreement on a 0-10 scale on the following four statements: (1) "We are in the first stages of global warming and climate change"; (2) "If the present rate of coal and oil use continues, serious long-term environmental damage will occur"; (3) The dangers of global warming are being overemphasized for political reasons"; (4) "There is not enough scientific evidence to support claims that the earth is getting warmer". Answers to these four questions were used to construct a scale from zero to 10 measuring belief in climate change, with higher values capturing greater belief in climate change and its possible consequences.[11] Moving from the lowest value of political knowledge, not answering any of the political knowledge questions correctly, to the highest, answering all six questions correctly, increases the predicted value on this scale by slightly more than one for somewhat liberals, yet

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[10] These predicted differences, moreover, are statistically significant. For somewhat liberal, the 90 percent confidence interval of the estimate of 0.1033does not include zero: [0.0169, 0.2033]. And for somewhat conservative, the difference was statistically significant. The 90 percent confidence interval of the estimate also does not include zero: [-0.2555,-0.0159]. Moreover, I estimated regression models for both self-identified liberals and conservatives, predicting concern, shown in Appendix D. The coefficient estimate of political knowledge is positive but barely not statistically significant for liberals (two-tailed *p*-value = 0.108) and the estimate for political knowledge is negative and statistically significant for conservatives (two-tailed *p*-value = 0.052). I assume a higher alpha value of 0.1 because I am analyzing a subsample of the survey.

[11] Two of the questions are reverse-coded so scale is logical. The four question scale had a Cronbach's alpha of 0.88, showing that the scale is reliable. In addition, in an exploratory factor analysis, the common factor explained 68 percent of the total variance and the common factor was strongly correlated with responses to all four questions. So there is strong evidence that the climate change belief scale is capturing latent belief that climate change is the result of human activity and its consequences are serious.

decreases the value by more than three for somewhat conservatives. Both of these differences were significantly different from zero.

In both the 2008 and 2012 ANES, respondents were also asked about the cause of climate change. I estimated models for both survey years predicting whether respondents choose “mostly by things people do” or not, measuring whether individuals accept that climate change is the result of human activity. In 2008, for somewhat liberals, moving from the lowest to highest value of political knowledge increases the predicted probability of believing climate change is caused by human activity by about 50 percent, a statistically significant and substantially important change. Liberals who answer all six questions incorrectly are predicted about 30 percent likely to say climate change is caused mostly by things people do, while liberals who answer all the questions correctly are predicted to be about 78 percent likely to consider climate change caused by human activity. For somewhat conservatives, the predicted probability of viewing climate change as the result of human activity decreases by 18 percent moving from the lowest to highest values of political knowledge. Somewhat conservatives who answer all six political knowledge questions correctly are predicted to be only 21 percent likely to say climate change is caused mostly by things people do.[12]

In the 2012 ANES, respondent are once again asked about the cause of climate change, and the results on this question are very similar. Among those who did not answer any political knowledge questions correctly, the predicted probability of both liberals and conservatives considering climate change the result of human activity is about 30 percent. For liberals who answer all five political knowledge questions correctly, the predicted probability is about 80 percent, a statistically significant increase; for somewhat conservatives who answer all five questions correctly, the predicted probability of answering that climate change is caused “mostly by things people do” is only about 10 percent, a

[12] In the regression models for just the liberal and conservatives samples, political knowledge had a statistically significant and positive effect among liberals and a negative but not statistically significant effect among conservatives (two-tailed *p*-value=0.452). The results are shown in Appendix D.

statistically significant decrease.[13] So among the most political knowledgeable Americans, the predicted difference in accepting that climate change is the result of human activity is about 70 percent, a massive difference capturing the deep ideological polarization on climate change in the United States.[14]

So the findings from two public opinion surveys in the United States show that political knowledge conditions the influence of left-right political orientation on climate change opinions. For liberals, greater political knowledge and awareness increases their concern about climate change and acceptance of climate science, while for conservatives, greater political knowledge and awareness decreases their concern about climate change and acceptance of climate science.[15] This is strong evidence that Americans are using elite cues to form their climate change attitudes. Less knowledgeable and aware conservatives and liberals have a very similar level of concern about climate change and belief in climate science. This group of citizens is not divided on climate change because they are unlikely to be able to use elite cues to form opinions. But more politically knowledgeable and aware citizens—more able to identify and use elite cues—are in line with ideologically similar elites. This group of citizens is deeply divided. There is evidence in support of *H2*.

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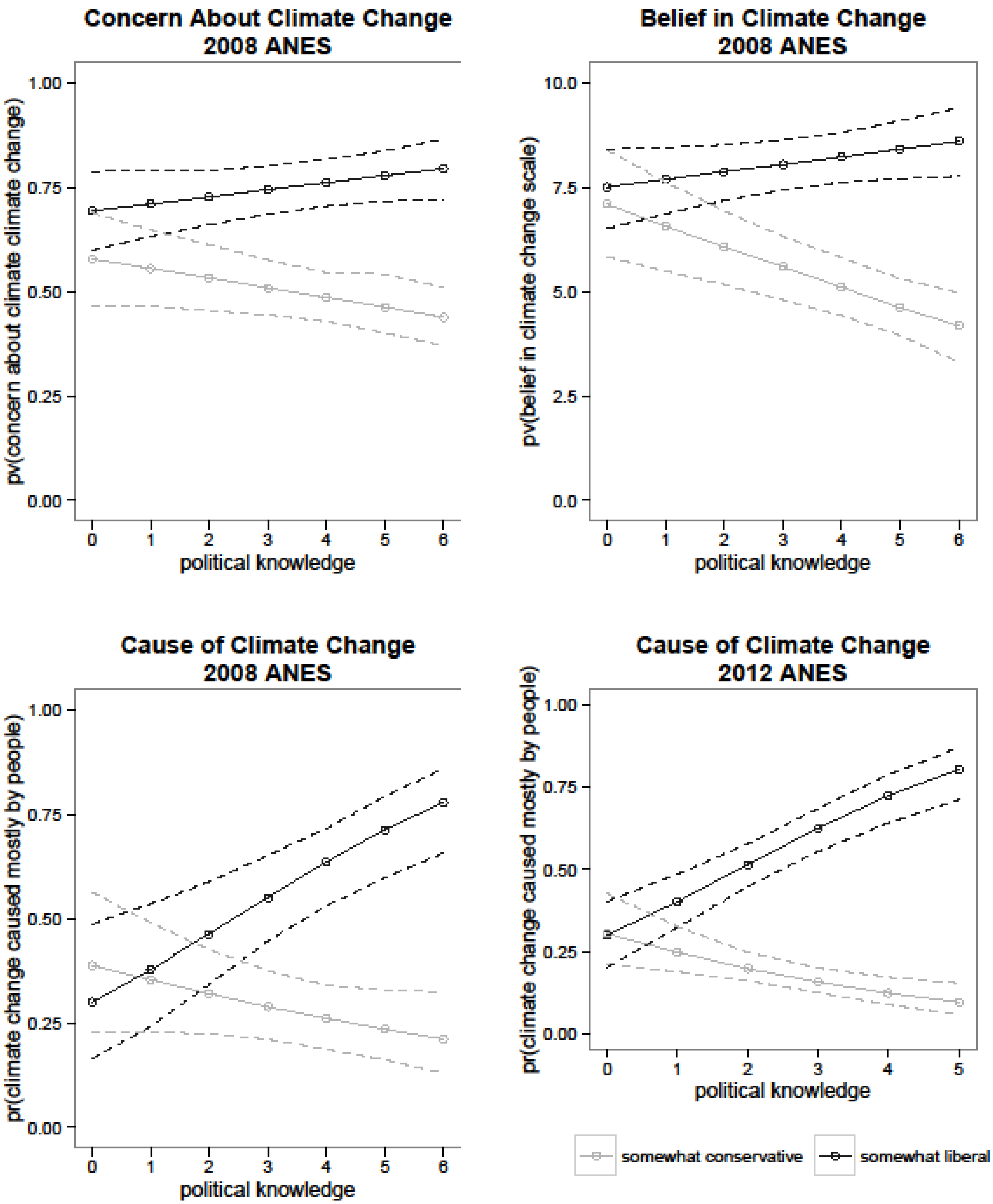
[13] In a regression model predicting considering climate change the result of human activity among liberals, political knowledge had a significant and positive influence. In the model for conservatives, political knowledge had a negative influence, but it was not statistically significant (two-tailed *p*-value=0.136). Results in Appendix D.

[14] I also estimated models using measures of self-described interest in politics in the 2008 ANES and self-described attention to politics in 2012 instead of the measure of political knowledge. The results are nearly identical. These results are presented in Appendix D.

[15] Statistical analysis using a measure of political awareness rather than political knowledge produces virtually the same results.

Figure 6.2: Conditional effect of political ideology on predicting climate change opinions across values of political knowledge in the United States (2008 and 2012 American National Elections Studies)



Notes: Predicted values and probabilities are calculated for a 40-49 year old female holding education and biblical literalism at their mean values. Statistical models presented in Appendix D.

6.7 The conditional effect of interest in politics in the United States and wealthy countries

In the United States, for liberals, political knowledge and awareness has a positive effect on concern about climate change and in belief climate change science, while for conservatives, political knowledge and awareness has a negative effect on these same attitudes. However, it could be that I am not capturing the effect of elite opinion. Instead, more politically knowledgeable Americans might be more likely to be aware of how their social and economic positions align with their climate change opinions. To explore this possibility, I now compare the conditional relationship between political engagement and left-right political orientation in the United States to other wealthy countries. If this conditional relationship exists across other wealthy countries, then it could the result of more politically aware individuals matching their political ideology and opinions on climate change. If this conditional relationship does not exist across other wealthy countries, then this specific finding in the United States can likely be attributed to citizens using elite polarization as a cue in only the United States.

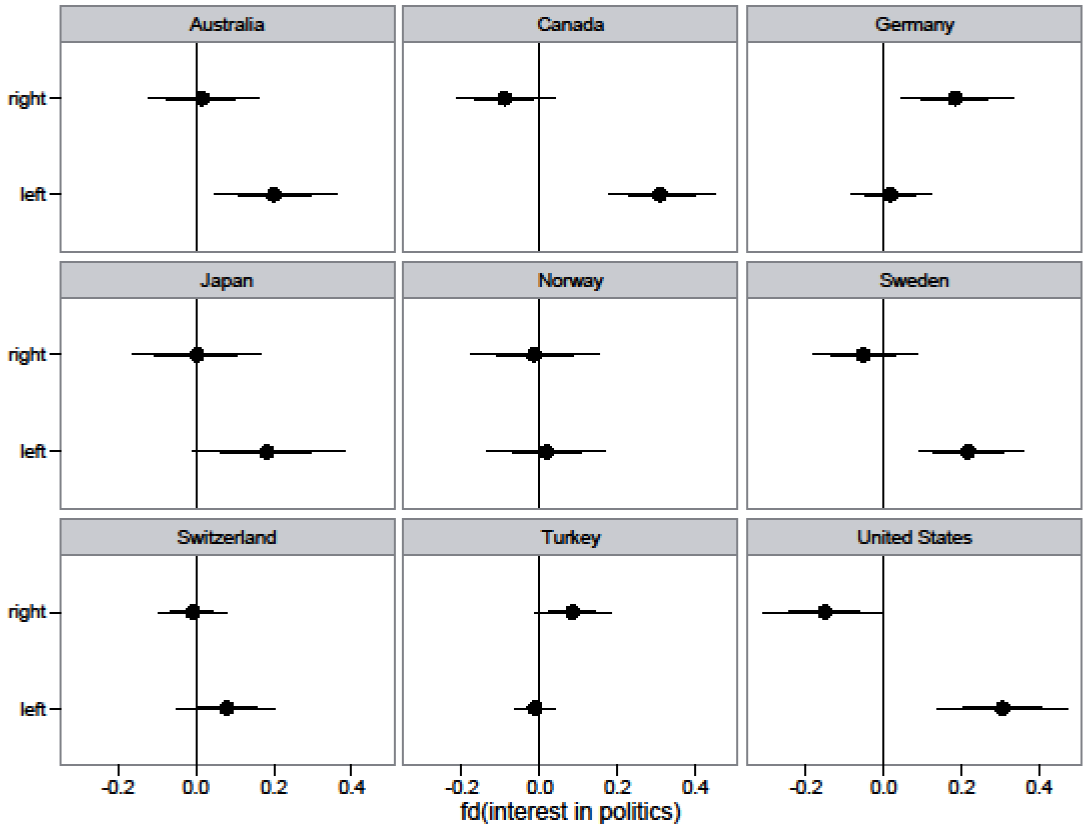
Unfortunately, the WVS does not provide a direct measure of political knowledge like the one used in the previous section (or even a measure scientific and/or environmental knowledge). So instead use a difference measure of political engagement: self-described interest in politics. Self-described political interest is open to possible biases in responses, such as a respondent overstating or understating his or her interest for social desirability, but it should provide a measure as to how closely an individual follows politics and elite discourse about politics. An individual who is says he or she is very interested in politics should be more likely to know where elites stand on issues than an individual who says he or she is not very interested in politics. In the 2008 ANES, self-described interested in politics is positively and linearly correlated to political knowledge (r=0.29) and in the 2012 ANES, self-described attention to politics is positively and linearly correlated to political knowledge (r=0.26).

I estimated ordered logistic regression models predicting perceived seriousness of climate change for those on the left and those on the right in each OECD country using the WVS. The most important independent variable is interest in politics.[16] I also control for socio-economic factors, age, gender, self-described class, and education. The results of these models are shown in Figure 6.3. The United States is the only country in which political interest has positive and statistically significant association with perceived seriousness for those on the left, yet political interest has a negative and statistically significant association with perceived seriousness for those on the right. For liberals, moving from low to high political interest increases the probability of considering climate change very serious by about 30 percent; for conservatives, moving from low to high political interest decreases this probability by 15 percent. As shown, in a few other countries political interest does have a significant effect on perceived seriousness of climate change among individuals on the left. In Sweden and Canada, unsurprisingly, political interest has a positive, significant, and strong substantive association with perceived seriousness of climate change for citizens on the left. Specifically, an individual on the left with high political interest is about 22 percent and 31 percent more likely to consider climate change very serious than an individual on the left with low political interest in Sweden and Canada respectively. But in Sweden and Canada, there is not a significant relationship between political interest and concern for those on the right, as the 90 degree confidence interval for the estimate on the right includes zero in both countries.[17]

[16] Political interest is collapsed this way in order to overcome small sample sizes in each cell and also show patterns across countries. I only include countries which have at least 25 respondents in each cell, so eight countries are dropped from the analysis.

[17] But as shown in Figure 6.3, in Canada, the 68 percent level of the estimate for those on the right does not include zero. The climate change denial machine exists in Canada, so this is evidence that it might be working among the public on the right in Canada.

Figure 6.3: Effect of interest in politics on predicting considering climate change very serious for left and right in select OECD countries (World Values Survey 2005-2009)



Notes: The predicted difference in the probability of considering climate change very serious between very interested and not at all interested in politics for a 40-49 year-old female who identifies with the middle class, holding education at its mean. The thick error bar represents the 68 percent confidence interval, and the thin bar the 90 percent confidence interval. The statistical models used to produce this figure are presented in Appendix D.

The analysis in this section shows that self-described general interest in politics has a unique conditional effect on left-right political orientation in the United States, supporting *H3*. Americans on the left with high political interest are significantly more likely than those with low political interest to say climate change is very serious. But for those on the right, the effect is the opposite; those who are more interested in politics are less likely to say climate change is very serious. This conditional relationship is not found in any other OECD countries. Americans seem to be suing ideologically similar elites to form opinions on climate change. It seems more engaged Americans are more likely to follow ideologically similar elites on climate change.

6.8 Discussion and conclusion

This chapter started with one main question in an effort to situation American public opinion on climate change in the comparative context. Why is American public opinion so polarized on climate change? I argue that Americans are likely turning to political and media elites as a shortcut in forming opinions on climate change. Unlike anywhere else in the world, American political elites are deeply divided on the possible risks from climate change and also more fundamentally on climate science. Conservative and Republican opinion leaders, such as Santorum, Limbaugh, and Will, call climate change a "hoax" and a "conspiracy". And on climate change, citizens could turn to ideologically similar elites, rather than attempt to gather and process the tremendous amount of information needed to form opinions on this issue.

What evidence do I have that the American mass public in the United States is following political elites? First, I showed that Americans are far more polarized on climate change than in other wealthy countries; left-right political orientation has by far its strongest effect on perceived seriousness of climate change in the United States. Specifically, using the World Values Survey, a liberal is predicted to be 48 percent more likely to consider climate change very serious than a conservative in the United States, while the next largest difference between the left and right is 26 percent in Switzerland.

Second, using public opinion surveys from the United States, I show that the influence of left-right political orientation on climate change opinions is conditioned by political knowledge. For liberals, political knowledge increases concern about climate change and the probability of accepting climate science, while for conservatives, political knowledge decreases concern about climate change and the probability of accepting climate science. For Americans with little knowledge about politics, there is no ideological divide on climate change. But Americans with great knowledge about politics are deeply polarized on climate change. Third, I show that this interactive relationship between left-right political orientation and engagement with politics is unique to the United States. Although in some other wealthy countries increasing interest in politics increased perceived dangerousness of climate change for individuals on the left, but in only the United States does interest in politics decrease perceived dangerousness for those on the right.

This analysis provides evidence that aware and knowledgeable Americans turn in to their ideologically similar elites for cues in forming opinions on climate change. Politically aware conservatives watch *Fox News*, read the *Wall Street Journal*, and follow these expressed opinions on climate change, denying and dismissing its possible dangers. American public opinion is polarized not because everyone is divided on climate change, but because the most engaged Americans are deeply ideologically divided on climate change.

In the United States, this analysis provides a bleak picture for climate change communicators and educators. This analysis reconfirms that the assumption that increasing awareness leads to increased concern found in other research should be treated with skepticism (Guber 2013). For conservatives and Republicans, increased awareness actually seems to make it less likely climate change is considered serious. Prominent climate change activists, such as former Vice President Gore and billionaire Tom Steyer, are aggressive in their push for publicity and media attention. As Guber (2013) noted, increased focus on climate change activism might have the unintended boomerang effect of further alienating conservatives and Republicans from climate change science and action.

Moreover, it also raises concerns about the relationship political elites have with science in the United States. Conservative and Republican elites are rejecting an overwhelming scientific consensus on climate change. American conservatives and Republican are following individuals who do not know the science; political elites are not supporting science, they are undermining it. This conservative rejection of science is similar to the elite movement which rejected the health risks of tobacco, and this elite movement in support of tobacco delayed the proper public health response for decades (Oreskes and Conway 2010). American society paid a tremendous cost for this delay, and might once again pay a tremendous cost for inaction on climate change.

But there is a positive for climate change activists. This chapter does not find that American conservatives are innately unconcerned about climate change. They are not unconcerned for fervent ideological reasons. Instead, they are climate change deniers because they adopt the opinions of similarly conservative ideological elites. So when conservative and Republican elites realize the dangers of climate change and become concerned, we should expect the mass public to follow.

The last three chapters focused on explaining climate change risk perception. The last chapter, instead of looking at the influences of climate change risk perception, shifts to concentrating on the consequences of climate change risk perception. Specifically, it focuses on how perceived seriousness and dangerousness of climate change relates to environmental attitudes broadly and intended behaviors.

Chapter 7: How do individuals think about climate change and environmentalism?

7.1 Introduction

Cory Gardner, a Republican running for the United States Senate in Colorado in 2014, said in a campaign debate that "there is no doubt that pollution contributes to the climate changing around us" (Siddiqui 2014). Scientists would call carbon emissions a pollutant as it is very harmful to human health due to the consequences of climate change. But the problem of carbon emissions which cause climate change is different than air pollution caused by sulfur oxides, nitrogen oxides, toxic metals, and smog from industry and automobiles. For the public, it would be natural to separate climate change from air pollution. Climate change is a global environmental problem which cannot be easily observed and does not clearly and directly affect lives, while air pollution is a local environmental problem which can be directly observed. People can see smog and feel the effects of poor air quality, but they cannot see and feel climate change.[1] Yet Gardner at least this one time combined air pollution and climate change together as the same environmental problem. And Gardner is not alone. Americans and people around the world generally tend to think about climate change and air pollution together, even though there is reason to separate them onto distinct dimensions. This chapter shows that concern about climate change was closely related to concern about air and water pollution. But many in the global public, including a sizeable majority in the United States, see both climate change and nuclear power as dangerous, even though nuclear power is one possible policy solution to address climate change. Next, this chapter looks at the influence of climate change risk perception on attitudes and behaviors requiring greater commitment to climate change. Specifically, I analyze the relationship between climate change risk perception and intended willingness to pay to address climate change and then the relationship between

[1] Even though people cannot directly experience climate change, people can experience local temperature fluctuations. And recent research has shown these local temperature fluctuations influence climate change attitudes in the United States (Egan and Mullin 2012, Donner and McDaniels 2013)

risk perception and considering the environment generally and/or climate change specifically important issues. This section comes to three conclusions, one descriptive and two analytical.

- First, even among individuals who think climate change is serious, a substantial minority across countries are unwilling to alter their behavior to address the consequences of climate change. Across about two dozen countries in two survey years, about four-in-ten of individuals who view climate change as "very serious" are unwilling to agree to pay higher prices to address climate change. And most of those who consider climate change a dangerous problem are unwilling to rank the environment as more important than other issues and climate change as more important than other environmental problems. Of those who express that climate change is dangerous, only about one-in-five call the environment one of their most important issues or climate change their most important environmental problem.
- Second, citizens in richer countries are not more likely to support economic sacrifices than citizens in poorer countries, an obstacle for any international climate change agreement requiring richer countries to make greater economic sacrifices.
- Third, the influence of climate change risk perception on considering the environment and climate change important varies across countries. Specifically, climate change risk perception has a far stronger influence on ranking the environment and climate change as important in very rich and developed countries than in less wealthy and developed countries.

The findings in this chapter show that global public opinion on climate change presents both an opportunity and a challenge for policymakers seeking to address climate change. The opportunity for leaders who want to shape and move public opinion is to relate climate change to other more discernable environmental problems. Individuals seem to think of environmental problems in a collective way, rather than as individual issues. Therefore, policymakers could take advantage of this by framing climate change in the broader environmental context. Instead of warning of consequences of climate change separately, they could emphasize the positive externalities of possible mitigation policies for other environmental problems. Mitigation policies improving air quality, addressing worries about air pollution, reducing our use of oil and coal, and tackling concerns about using up our natural resources could be very popular with the public. Broadening the frame of climate change as an issue could make the global public more supportive of mitigation policies.[2]

But the challenge is daunting: individuals who consider climate change serious or dangerous do not necessarily see climate change as alarming. Many of those who say climate change is serious or dangerous seem unwilling to go beyond a statement on a survey. For most of those who say climate change is serious or dangerous, it is not an immediate, top-of-the-head issue. Many of those saying climate change is serious or dangerous are also unwilling to make economic sacrifices and most considered other issues and environmental problems more important. Most observers assume that a public obstacle to a policy solution is the group unconcerned by climate change, but this chapter shows that another obstacle could be this larger group for whom climate change is concerning but not as important as other issues. For policymakers who want to address climate change, cross-national public opinion is tough to make sense of, as the public seems worried about climate change, yet considers other issues more important. And for policymakers who do not want to address climate change, these findings are a reason to continue to focus on more publicly pressing issues.

7.2 Data, methodology, and measurement

Since the World Values Survey (WVS 2005-2009) asks only one question about climate change, this chapter draws from three additional cross-national public opinion surveys—the 2009 Pew Global Attitudes Study, 2010 Pew Global Attitudes Study, the International Social Survey Programme (ISSP 2009-2011)—to analyze how individuals think about climate change. These cross-national surveys are also used in Chapter 2 to describe global public opinion. The first section examines the relationship between climate change risk perception and risk perception of other environmental problems, with

[2] Ansolabehere and Konisky (2014) make a similar argument in the context of the United States. I argue here that this argument extends cross-nationally.

specific focus the dimensionality of risk perception. The ISSP asked about the dangerousness of seven possible environmental problems: “a rise in the world’s temperature caused by climate change”; “air pollution caused by cars”; “air pollution caused by industry”; “pollution of rivers, lakes, and streams”; “pesticides and chemicals used in farming”; “nuclear power stations”; and “modifying the genes in certain crops”. The ordered responses categories and corresponding numeric values for the analysis in this chapter are “not dangerous at all” (0); “not very dangerous” (1); “somewhat dangerous” (2); “very dangerous” (3); “extremely dangerous” (4).

In the second section, I examine the influence of concern about climate change on willingness to pay to address climate change, considering the environment an important issue, and considering climate change an important environmental problem. So the perceived seriousness or dangerousness of climate change is the independent variable of interest, and there are three dependent variables in the statistical models. First, the Pew Global Attitudes surveys in 2009 and 2010 asked respondents whether they agree or disagree with the following statement: “People should be willing to pay higher prices in order to address global climate change”. For the analysis, agree is coded as one and all other responses are coded as zero, so I am modeling the probability of agreeing to pay higher prices to address climate change. Second, the ISSP asked respondents which issue is most important and also next most important for their country. Response options are health care; education; crime, the environment; immigration; the economy; terrorism; poverty; none of these; and can’t choose. To measure considering the environment an important issue, choosing the environment as the most important issue or next most important issue for their country is coded as one and all other response combinations are coded as zero. Third, the ISSP also asked respondents which environmental problem they think is most important for their “country as a whole”. Response categories are air pollution; chemicals and pesticides; water shortage; water pollution; nuclear waste; domestic waste disposal; climate change; genetically modified foods; using up our natural resources; none of these; and can’t choose. To measure considering climate change an important environmental problem, choosing climate change is coded as one and all other responses are coded as zero. The most important independent variables in the analysis are perceived seriousness of climate change in the Pew Global Attitudes surveys and perceived dangerousness of climate change in the ISSP. In the 2009 Pew Global Attitudes Survey, respondents were asked about the level of seriousness of "global warming", while in 2010 Global Attitudes Survey, respondents were asked about the level of seriousness of "global climate change". So the question wording is slightly different across the two Pew Global Attitudes surveys. The ordered response options and corresponding numeric values for both years are "not a problem" (0); "not too serious" (1); "somewhat serious" (2); "very serious" (3). In the ISSP, respondents were asked how dangerous "a rise in the world's temperature caused by climate change" would be, with the response options and numeric values discussed in the previous paragraph.

The first section, which looks at relating climate change to other environmental problems, uses both multilevel modeling and exploratory factor analysis. The random-intercept multilevel models, which allow for clustering of survey respondents within countries, are used to produce estimates of the strength and direction of the relationship between perceived dangerousness of climate change and perceived dangerousness of other environmental problems, controlling for demographic factors. I also estimate linear models to predict the strength and direction of the relationship between perceived dangerousness of climate change and perceived dangerousness of other environmental problems in the United States. The goal of exploratory factor analysis is to explore the underlying dimensions of the perceived dangerousness of seven environmental problems (Bartholomew, et al. 2008, Mulaik 2010).

The second section, which looks at the relationship between climate change risk perception and other opinions and intended behaviors on climate change, uses multilevel modeling to estimate the average effect across countries and also explore how this effect varies across countries. Since all three dependent variables in this section—willingness to pay to address climate change, considering the environment an important issue, and viewing climate change as an important environmental problem—are dichotomous, I assume a binary logistic functional form in estimating the models, so the individual level variance is fixed and not estimated. Multilevel random-intercept models model are used to estimate the average effect of individual-level independent variables, including the perceived seriousness or dangerousness of climate change, across countries. To explain country-level heterogeneity in the random-intercept multilevel models, I include measures of country-level wealth and development, GDP per capita and Human Development Index (HDI) score. Finally, I introduce cross-level interaction terms in random-intercept, random-effect models, in which allow both the constant and the estimated effect of perceived seriousness of climate change to vary across countries.

7.3 Relating climate change risk perception and risk perception of other environmental problems

This chapter first looks at the relationship between perceived dangerousness of climate change and perceived dangerousness of other environmental problems. Is risk perception of some environmental problems more closely related to climate change risk perception than others? Is there a latent attitude that sparks worry about environmental issues? This section shows that there is little evidence that people think about climate change differently than other environmental problems, including the various forms of pollution; individuals seem to think about environmental problems in the same way. In most countries, including the United States, many individuals who water and air pollution are dangerous also say climate change is dangerous

7.3.1 Relating perceived dangerousness of climate change and perceived dangerousness of pollution

Worry about climate change is related to worry about other environmental problems, and in particular, worry about air and water pollution. I first explore the relationship between perceived dangerousness of climate change and perceived dangerousness of other environmental problems. Controlling for demographic factors, perceived dangerousness of climate change is significantly correlated with perceived dangerousness of all six other included environmental problems. Specifically, an individual who considers climate change “very dangerous” is predicted to consider all six problems between 0.16 and 0.19 more dangerous on the zero-to-one range in which zero is “not dangerous at all” and one is “extremely dangerous” than an individual who considers climate change “not very dangerous”. In the United States, perceived dangerousness of climate change is also strongly related to perceived dangerousness of other environmental problems. An American who views climate change as “very dangerous” is predicted to see the six other problems as between 0.13 and 0.2 more dangerous on the zero-to-one range than an American who considers climate change “not very dangerous”. Climate change risk perception is most strongly correlated with concern about risk perception of air pollution from cars and industry in the United States, showing that many Americans worried about climate change are also worried about air quality.

By exploring the dimensionality of environmental concern, I again show that risk perception of climate change and risk perception of pollution is closely related. While environmental concern is usually defined as including various attitudes, opinions, behavior on the environment, here the focus is on one particular dimension of environmental concern: risk perception of possible environmental problems, including climate change.[3] Most previous research on environmental concern has focused on public opinion in the United States, but here I look at both concern about environmental problems in the United States and cross-nationally.[4] To explore the dimensionality, I use exploratory factor analysis, a method to discover the underlying linear structure of risk perception of environmental problems (Bartholomew, et al. 2008, Mulaik 2010). Generally, risk perception of environmental problems is a uni-dimensional, and across most countries, the perceived dangerousness of climate change is closely related to the perceived dangerousness of air and water pollution.

I first conducted an exploratory factor analysis for the entire sample of 32 countries in the ISSP. The exploratory factor analysis of responses to the dangerousness of the seven environmental problems in

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[3] Environmental concern consists of beliefs, attitudes, intended behaviors, and actual behaviors. Dunlap and Jones (2002) define environmental concern as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or willingness to contribute personally to their solution.” Environmental concern could include belief in environmental and scientific facts, assessing the seriousness of environmental problems, willingness to sacrifice economically to protect the environment, and participation in recycling, limited electricity use, and environmental activism (Van Liere and Dunlap 1980, Carman 1998, Guber 2003).

[4] Recent cross-national research on environmental concern has found evidence that it is a multi-dimensional concept (Dunlap and York 2008, Marquart-Pyatt 2008, Knight and Messer 2012, Marquart-Pyatt 2012, Pampel 2014). Marquart-Pyatt (2008), using the 2000 International Social Science Programme (ISSP) cross-national survey, finds a multiple dimensions to environmental concern, capturing an individual’s idea on how humans should relate to the environment and an intended behavior dimension, capturing how willing an individual is to make economic sacrifices for the environment. And, in later work, Marquart-Pyatt (2012) adds another attitudinal dimension to environmental concern, capturing risk perception of environmental problems. Dunlap and York (2008) find five dimensions of environmental concern using the World Values Survey (WVS) wave 4: willingness to pay, environmental protection versus economic growth, support for the environmental movement, local environmental problems, and global environmental problems. Knight and Messer (2012) also find five dimensions of environmental concern analyzing wave 5 of the WVS.

all countries suggests one underlying dimension.[5] The common factor has an eigenvalue of 2.8, explaining 40 percent of the all variance in the observed responses.[6] Individuals around the world tend to think about the risks from climate change like they think about the risks from other environmental problems; the same latent attitude is related to responses to seven environmental problems, including climate change. Table 2.1 shows the results of factor structure, or how correlated each variable is with the common, unobserved factor. There are differences in the correlations by environmental problem with the common factor. Perceived dangerousness of air pollution from industry, air pollution from cars, water pollution, and climate change are more highly correlated with the common factor than the perceived dangerousness of other environmental problems. This also suggests that the one factor model does a poorer jobs explaining variation in the perceived dangerousness of genetically modified crops and nuclear power. Each variable is at least moderately correlated with the common factor, so one factor is sufficient, but this result suggests that the structure might be more complicated within countries.

Table 7.1: Exploratory factor analysis of risk perception of environmental problems in all countries (International Social Survey Programme 2009-2011)

Environmental Problem	Standardized factor loading
Climate change	0.64
Air pollution from cars	0.65
Air pollution from industry	0.71
Pollution of rivers, lakes and streams	0.65
Pesticides and chemicals in farming	0.68
Genetically modified crops	0.58
Nuclear power stations	0.50
Proportion of variance explained	0.40

Notes: The factor analysis was fit with principle axis factoring.[7]

To explore across country variation, I perform exploratory factor analyses for each individual country in the ISSP to determine the structure of risk perception on environmental problems. This

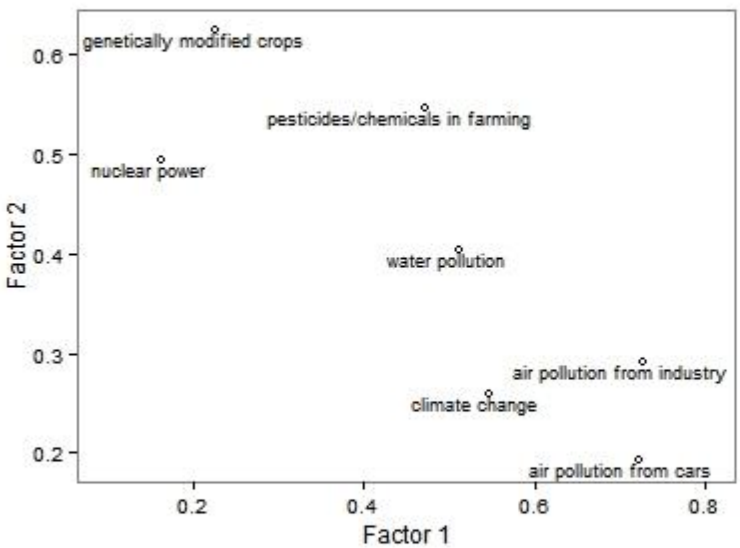
[5] I use a scree plot to determine the number of factors to include in the analysis. A scree plot shows the eigenvalues by the factors in order of extraction. To determine the number of factors to include, the “elbow” of the scree plot is identified. Another common decision rule is to include factors with eigenvalues greater than one. In this situation, both decision rules result in a solution with one common factor for responses to the dangerousness of the seven environmental problems in all included countries.

[6] The eigenvalue is a measure of the variance accounted in all variables by the common factor.

[7] Using maximum likelihood produced virtually identical results.

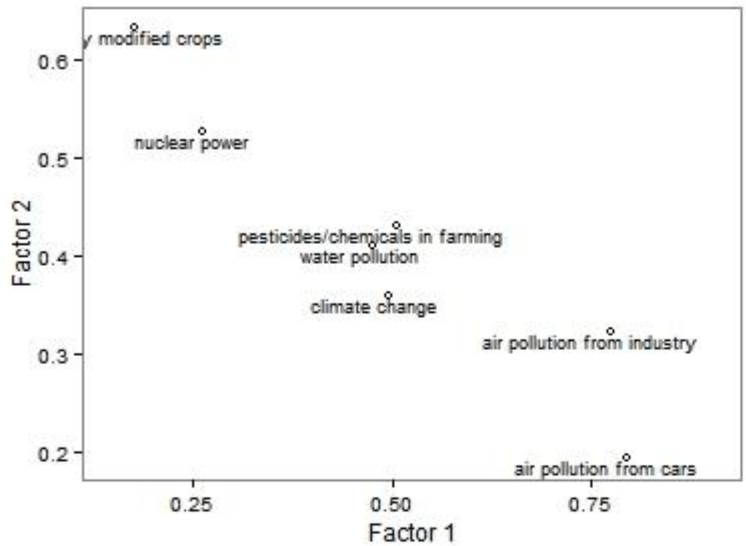
analysis confirms the findings of the all country model, showing a latent attitude motivates climate change risk perception and risk perception of air and water pollution. For example, in Canada, perceived dangerousness of climate change and perceived dangerousness of air pollution from industry, air pollution from cars, and pollution of rivers, lakes, and streams map on to the same underlying dimension. Figure 7.1 shows the results of an exploratory factor analysis for respondents in Canada with a varimax rotation, resulting in two uncorrelated common factors. The perceived dangerousness of climate change, like air pollution from cars and industry, is far more correlated with Factor 1 than Factor 2, while nuclear power and genetically modified crops are more correlated with Factor 2.

Figure 7.1: Factor loading plot, Canada (International Social Survey Programme 2009-2011)



In at least a few countries, such as the United States, climate change does not map onto either underlying dimension. Here one dimension is defined by underlying attitudes toward air pollution and the other dimension is defined by newer environmental problems—genetically modified crops and nuclear power. Other problems, including climate change, form a cluster that does not map onto either dimension. Figure 7.2 shows the results of an exploratory factor analysis for respondents in the United States, resulting in two orthogonal factors. But still, even in the United States, there is evidence that Americans modestly relate the risks from climate change to the risks from air and water pollution.

Figure 7.2: Factor loadings plot, United States (International Social Survey Programme 2009-2011)



This section argues that at the individual-level, climate change risk perception is closely related to risk perception of other environmental problems, and in particular risk perception of air and water pollution. Individuals who consider climate change dangerous also mostly also consider air and water pollution dangerous and vice-versa, in both the United States and cross-nationally. For policymakers, this shows that their focus should not necessarily be on only climate change. It seems that the global public would be more or as welcome to broader policy addressing numerous environmental problems, including climate change and pollution. A single emphasis on climate change might actually be detrimental to addressing the consequences of climate change, as broader environmental policy could not only address climate change, but also improve air and water quality and expand sustainable energy, positive externalities of climate change policy the global public would support.

7.3.2 Perceived dangerousness of climate change and nuclear power

Nuclear power, since it does not emit CO_2 emissions, is considered by policymakers and scientists to be crucial to any solution addressing climate change. Yet public opinion has always been a major obstacle to expanding nuclear power. Citizens generally reject the construction of nuclear power plants in their local area and react negatively to accidents at nuclear power plants (Ansolabehere and Konisky

2014).[8] In addition, perceived dangerousness of climate change is positively correlated with perceived dangerousness of nuclear power plants. Across all 32 countries in the ISSP, the relationship between the perceived dangerousness of climate change and perceived dangerousness of nuclear power is of similar strength as the relationship between the perceived dangerousness of climate change the perceived dangerousness of six other environmental problems.[9] Controlling for demographic factors, the positive relationship between climate change and nuclear power is slightly stronger the relationship between climate change and pesticides in farming, climate change and pollution from cars, and climate change and pollution from industry across all countries. And in the United States specifically, controlling for demographic factors, the relationship between nuclear power and climate change is stronger than the relationship between pollution of water and climate change, pesticides/chemicals in farming and climate change, and genetically modified foods and climate change.

Unsurprisingly, what drives this positive and substantially relationship between perceived dangerousness of climate change and perceived dangerousness of nuclear power is that many individuals find both to be dangerous. Across all countries, of those who consider climate change “very dangerous” or “extremely dangerous”, a majority—54 percent—also consider nuclear power stations “very dangerous” or “extremely dangerous”. Specifically in the United States, 61 percent of Americans who view climate change as “very dangerous” or “extremely dangerous” also view nuclear power stations as

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[8] Research has shown that a nuclear disaster likely results in a decline in public acceptance and increase in perceived dangerousness of nuclear power. Previous studies examining public opinion after nuclear accidents at Three Mile in Pennsylvania and Chernobyl show that public becomes wary (Rosa and Dunlap 1994). And research on after the Fukushima nuclear power disaster finds that acceptance of nuclear power declined in Australia (Bird, et al. 2014), Great Britain (Corner, et al. 2011), and Switzerland (Siegrist and Visschers 2013).

The ISSP was completed between 2009 and 2011, so some country surveys were either in the field or took place after the Fukushima nuclear power disaster. Specifically, the ISSP survey was in the field in Canada, Denmark, Slovenia, and Switzerland during the Fukushima nuclear power disaster. And the ISSP survey was field after Fukushima in Croatia, Finland, Israel, Latvia, Mexico, Norway, and Taiwan.

[9] In every country the perceived dangerousness of climate change is positively correlated with the perceived dangerous of nuclear power.

"very dangerous" or "extremely dangerous".[10] Among those who see climate change as very risky, most also see nuclear power as very risky, both globally and in the United States. These individuals would likely reject a solution to climate change that includes an expansion of nuclear power, and instead probably prefer cleaner sustainable alternatives, such as wind, solar, and water, even if these sources are expensive and unlikely to meet global energy needs. If policymakers decide to include expanding nuclear power in any solution to reduce carbon emissions, they are going to have to change the minds of many of those most worried about climate change, which could be especially difficult. Public opinion is often seen as an obstacle to expanding nuclear power. This section shows just the difficulty of making policy to address climate change while also appeasing the public.

7.4 Relating climate change risk perception and willingness to pay

Democracy should require consistency between attitudes and behaviors. If policymakers cannot make sense of what the public wants, then it is difficult to make policy that reflects public opinion. The next two sections show how difficult it is for the policymakers in the United States and around the world to get a sense of public opinion on climate change. They could be concluding that the global public's high level of concern about climate change is actually weak and lacking depth in many countries, and people care more about other issues. This could help explain why both domestic policy in many countries and international policy have yet to address the consequences of climate change by meaningfully reducing carbon emissions.

This section looks at the relationship between climate change risk perception and intended behavior on climate change. The Pew Global Attitudes surveys in 2009 and 2010 asked respondents if they agreed or disagreed with the following statement: "People should be willing to pay higher prices in

[10] In the United States, of those Americans who said climate change is "very dangerous", 60 percent say nuclear power stations are "very dangerous" or "extremely dangerous". And of the group of the Americans who consider climate change "extremely dangerous", 64 percent consider nuclear power stations "very dangerous or "extremely dangerous".

order to address global climate change".[11] Citizens will most likely have to make economic sacrifices in any domestic and international policy to address climate change as sustainable energy is expected to be more expensive. Unsurprisingly, as perceived seriousness increases, so did the percentage of respondents willing to pay higher prices to higher prices in all countries in both survey years. But, importantly, a substantial minority of individuals who say climate change is serious, however, is unwilling to make economic sacrifices. Of those who view climate change as "somewhat serious" 39 percent disagreed in 2009 and 44 percent disagreed in 2010. And of those who view climate change as "very serious", 36 percent disagreed in 2009 and 35 percent disagreed in 2010. Even in this group, there is not widespread support for economic sacrifices to address climate change in all included countries.

How does this pattern vary across countries? Figure 7.3 shows the relationship between perceived seriousness of climate change and willingness to pay across countries in the Pew Global Attitudes 2009 and 2010 surveys. The results show that in most countries as perceived seriousness of climate change increases, the probability of being willing to pay higher prices to address climate change also increases.[12] But these results also show the reluctance of those who say climate change is serious to agree to make economic sacrifices. In seven countries in each survey year, less than a majority of individuals who consider climate change "very serious" are willing to pay higher prices to address climate change. Less than a fifth of Egyptians and Jordanians who say climate change is very serious are willing to pay, and about one-third of Mexicans who say climate change is very serious are willing to pay.[13]

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[11] Note that the question wording does not address where the additional revenue from higher prices would go or specifically how much prices would go up.

[12] In Egypt and Mexico in 2009, a greater proportion of those who say climate change is not serious (choosing either "not serious at all" or "not very serious") agree to pay to address climate change than those who say climate change is "very serious." Even considering small sample sizes in these groups, this is a surprising finding.

[13] Even in those countries in which a majority of those who view climate change as "very serious" are willing to make economic sacrifices to address climate change, there is still a substantial minority unwilling to back up their concern with even intended behavior. For example, in two of Western Europe's most important countries—Great Britain and France—there is not a clear consensus among citizens who say climate change is serious that they should sacrifice economically to address climate change. In France, less than four-in-ten and six-in-ten of those who say climate change is "somewhat serious" and "very serious" respectively agree to pay higher prices. In Great Britain, 70 percent and 74 percent in 2009 and 2010 respectively of those who consider climate change very serious agree to sacrifice economically, the largest percentage of any country. Even though the concerned segment of the

In the United States, among Americans who considered climate change "somewhat serious", more Americans are unwilling to pay than willing to pay higher prices. For most of this group, which expressed at least some concern about climate change, there seems to be little desire to sacrifice to address climate change. At least among Americans who view climate change as "very serious", more agree than disagree, but roughly one-third in both survey years still disagree with paying higher prices to address climate change.

British public is among the most willing to pay, a substantial minority—about three-in-ten and one-in-two of those who answer "very serious" and "somewhat serious"—respectively does not agree to pay higher prices. Even in Western Europe among the most worried about climate change there is not overwhelming support for paying higher prices.

Figure 7.3: Relationship between perceived seriousness of climate change and willingness to pay to address climate change, by country (Pew Global Attitudes Project 2009-2010)

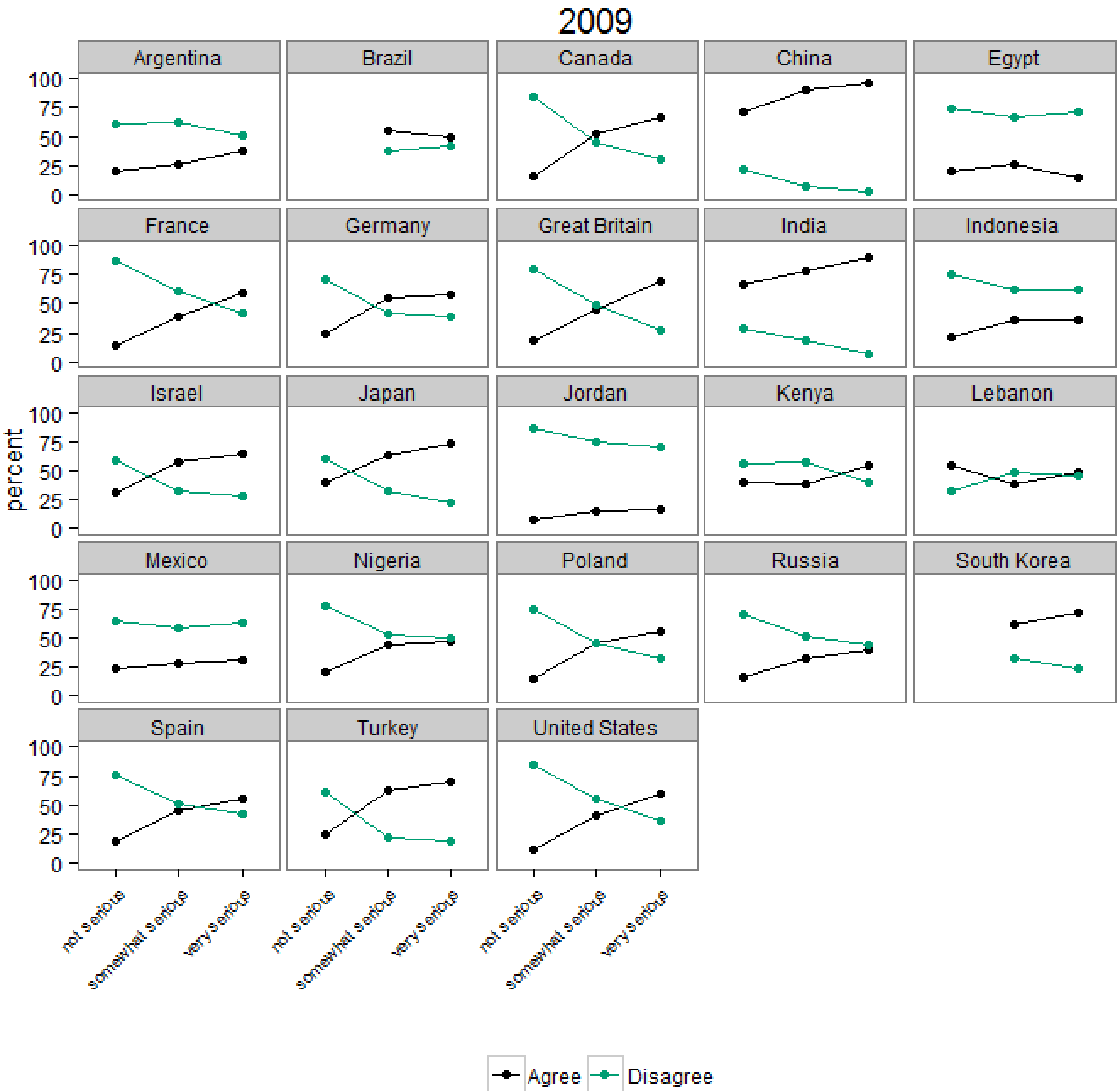
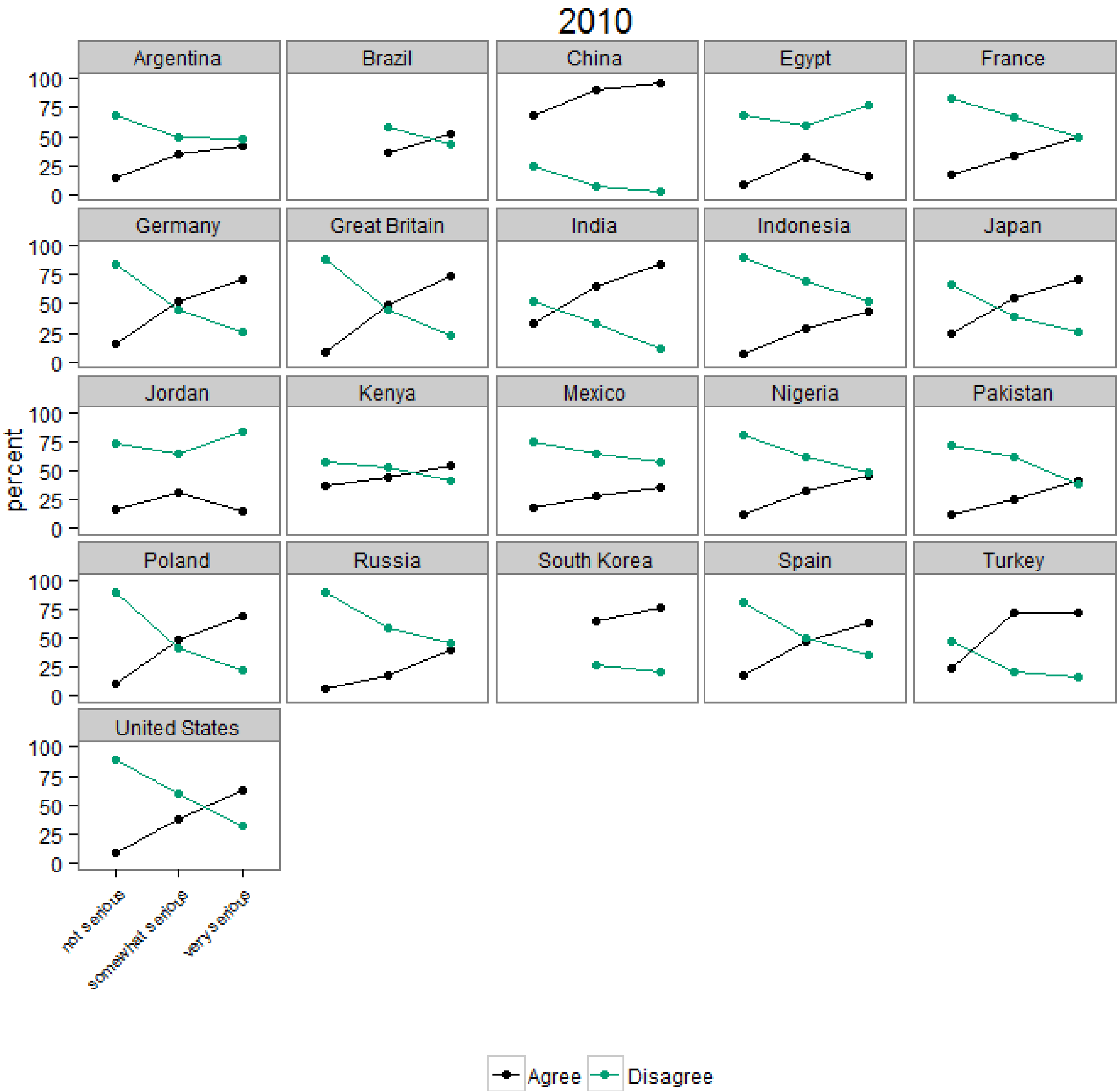


Figure 7.3 (cont'd)



Notes: "Not a problem" and "not too serious" are collapsed into the category "not serious" to provide a larger sample. Still, in Brazil and South Korea in both 2009 and 2010, fewer than 30 respondents say climate change is "not serious", so Brazil and South Korea are excluded from this figure. Palestinian Territories in 2009 is also excluded from this figure.

Next, I turn to multilevel models predicting willingness to pay higher prices as a function of perceived seriousness of climate change, gender, age, and at the country-level, the natural logarithm of GDP per capita and the Human Development Index, to measure country wealth and development. Equation 1 shows the estimated formula for considering willingness to pay as a latent attitude.

$$(1)\ (agreeing\ to\ pay\ higher\ prices)_i^* \sim N(\alpha_{j[i]} + \beta_1 * seriousness + \beta_2 * female + \beta_3 * age < 30 + \beta_4 * age30-39 + \beta_5 * age40-49 + \beta_6 * age50-59 + \beta_7 * age60-69 + \beta_8 * age \geq 70, \sigma_y^2)$$

$$\alpha_j \sim N(\gamma_{00} + \gamma_{01} * GDP\ per\ capita/HDI, \sigma_\alpha^2)$$

Considering willingness to pay has two response options, the logistic distribution is used as a link function, so the individual-level variance is fixed. Table 7.2 shows the results. These are random-intercept models, so each intercept varies across countries.[14] The models show that risk perception has a strong influence on willingness to pay across countries. The coefficient estimate for perceived seriousness of climate change is positive, showing that increased perceived seriousness is associated with increasing likelihood of stating a willingness to sacrifice economically. And its substantive strength is unsurprisingly great. In 2009, the difference in predicted probabilities on average across these two dozen countries of being willing to pay between those who say climate change is "not a problem" and "very serious" is 37 percent; it 2010, this predicted difference is 49 percent. Unsurprisingly, climate change risk perception dramatically increases the probability of agreeing to pay higher prices to address climate change.

[14] More information on the variables is included in Appendix A. The modeling strategy for this project is addressed in detail in Chapter 3. I use multilevel models to address for clustering within countries. I allow intercepts to vary across countries in all models, thus allowing intercepts to be predicted by level-two covariates.

Table 7.2: Random-intercept binary logistic models predicting agreeing to pay higher prices to address climate change (Pew Global Attitudes Studies 2009-2010)

	2009			2010		
	(1)	(2)	(3)	(4)	(5)	(6)
Climate change risk perception (perceived seriousness)	**0.5561**	**0.5561**	**0.5561**	**0.7948**	**0.7948**	**0.7948**
	(0.0795)	(0.0795)	(0.0795)	(0.0922)	(0.0923)	(0.0923)
Female	-0.0727	-0.0727	-0.0727	-0.0014	-0.0015	-0.0015
	(0.0445)	(0.0445)	(0.0445)	(0.0585)	(0.0585)	(0.0585)
Age younger than 30	0.0843	0.0846	0.0845	-0.0955	-0.0952	-0.0953
	(0.0480)	(0.0480)	(0.0480)	(0.0676)	(0.0677)	(0.0677)
Age 30-39	0.0760	0.0761	0.0761	-0.0344	-0.0342	-0.0342
	(0.0458)	(0.0457)	(0.0457)	(0.0569)	(0.0569)	(0.0569)
Age 50-59	0.0671	0.0669	0.0670	-0.0447	-0.0449	-0.0448
	(0.0538)	(0.0540)	(0.0540)	(0.0593)	(0.0592)	(0.0592)
Age 60-69	0.1218	0.1214	0.1216	-0.0178	-0.0183	-0.0182
	(0.0692)	(0.0694)	(0.0694)	(0.0726)	(0.0726)	(0.0726)
Age 70 and older	0.0981	0.0976	0.0979	-0.1289	-0.1297	-0.1294
	(0.0913)	(0.0915)	(0.0914)	(0.0736)	(0.0737)	(0.0736)
Country-level variables						
Natural logarithm of GDP per capita		0.0866			0.1010	
		(0.1325)			(0.1120)	
HDI			0.4726			0.7954
			(1.1556)			(0.9777)
Constant	-1.3322	-2.1231	-1.6902	-1.8353	-2.7447	-2.4283
	(0.1984)	(1.2584)	(0.9160)	(0.1851)	(1.0089)	(0.7378)
Variance component						
Country-level variance	**0.7539**	**0.7418**	**0.7499**	**0.7556**	**0.7395**	**0.7453**
	(0.2751)	(0.2930)	(0.2849)	(0.2893)	(0.3061)	(0.3015)
Number of respondents	23858	23858	23858	22095	22095	22095
Number of countries	25	25	25	25	22	22
AIC	27451	27452	27453	24392	24394	24394

Notes: Cell entries are logistic regression coefficients with the standard error in parenthesis for a random coefficient, random intercept model. Listwise deletion was used. **Bold** indicates two-tailed $p<0.05$. The Palestinian Territories were not included in the 2009 models.

But the models also show that individuals who say climate change is a serious problem are far from guaranteed to also say they agree to pay higher prices to address climate change. A 40-49 year-old woman who considers climate change somewhat serious has a predicted probability of 43 percent in the 2009 survey and predicted probability of 44 percent in the 2010 survey of agreeing to pay higher prices to address climate change on average across countries. And a 40-49 year old women who views climate change as very serious is predicted to be 57 percent in 2009 and 64 percent in 2010 likely to accept higher prices. So the models confirm the finding from above: it is far from a certainty that an individual who considered climate change very serious also would agree to pay higher prices. Globally, those who think climate change is a serious problem are predicted to be divided over being willing to pay to address it.

In addition, the multilevel models show that there is variation across countries in probability of agreeing to pay higher prices to address climate change. But a country's wealth and development does not explain this variation. In models for both surveys, the estimates for the natural logarithm of GDP per capita and HDI are not statistically different from zero. Citizens in wealthier and more developed countries are not more willing to pay to address climate change than citizens in less wealthier and developed countries. We should not assume that citizens in rich countries would be more willing to make greater economic sacrifices as part of international mitigation police. The evidence from these two cross-national surveys suggests that citizens in rich countries would be as reluctant to make any economic sacrifices as citizens in poor countries, even though citizens in rich countries should be able to more easily afford economic sacrifices. This reluctance among citizens of richer countries could be a major obstacle for policymakers crafting a national policy and international agreements going forward.

7.5 Climate change risk perception and the environment and climate change as most important issues

Is perceived dangerousness of climate change related to considering the environment an important issue and climate change the most important environmental problem? The analysis here shows this relationship is similar to the relationship between risk perception and willingness to pay discussed in the previous section. Once again there is a positive relationship; individuals who consider climate change dangerous are more likely to view the environment as one of their most important issues or climate change as their most important environmental problem than those who consider climate change not dangerous. But even though concerned individuals are more likely to consider the environment and climate change important issues, large majorities of those most worried about climate change still ranked other issues or other environmental problems as more important. This section provides further evidence that for many, alarm about climate change is not particularly deep.

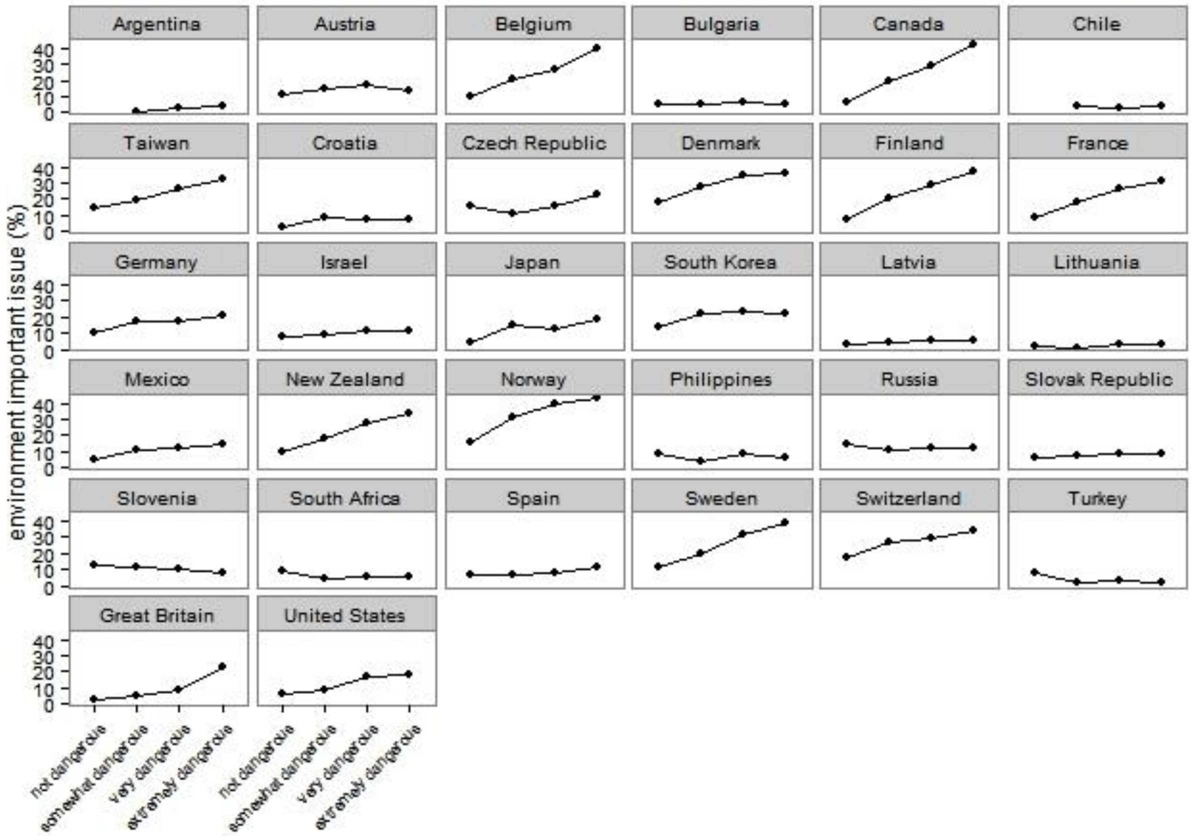
7.5.1 Climate change risk perception and considering the environment a most important issue

What is the relationship between the perceived dangerousness of climate change and viewing the environment as one of the two most important issues? On the ISSP, respondents were asked to name their most important and next most important issues from a list which included the environment. First, cross-nationally, unsurprisingly, perceived dangerousness of climate change is positively related with ranking the environment as an important issue. In all 32 countries, of those who consider climate change "not dangerous at all", six percent name the environment as their most or next most important issues, while 17 percent of those who consider climate change "extremely dangerous" name the environment as their most or next most important issues.

In all countries, among those individuals who called climate change "very dangerous" or "extremely dangerous", less than one-in-five rank the environment as one of their two most important issues. For example, in the United States, among those who say climate change is "very dangerous" or "extremely dangerous", more rank the economy (34 percent), health care (22 percent), education (19 percent), or terrorism (8 percent) than the environment (6 percent) as the most important issue for the United States. Another 11 percent in this group say the environment is America's second most important issue.[15] Among the who are concerned about the risks of climate change, across both rich and poor countries, only a fraction rank the environment as their most or next most important issue, instead preferring their governments' to focus the economy, health care, and education.

[15] For another example, in France, of those individuals who say climate change is very dangerous or extremely dangerous, more call the economy (27 percent), education (20 percent), health care (17 percent), and poverty (16 percent) than the environment (12 percent) their most important issue. About 16 percent of French call the environment their country's second most important issue.

Figure 7.4: Relationship between perceived dangerousness of climate change and considering the environment the most or next most important issue, by country (International Social Survey Programme 2009-2011)



Notes: "Not dangerous at all" and "not very dangerous" are collapsed into the category "not dangerous" to provide larger sample sizes across the categories of perceived dangerousness. Still, in Argentina and Chile, fewer than 30 respondents say climate change is "not dangerous at all" or "not very dangerous", so this category was dropped for these two countries.

Next, I use multilevel models to predict the probability of considering the environment an important issue as a function of risk perception, partisanship, education, age, gender, and at the country-level, the natural logarithm of GDP per capita and HDI. Equation 2 shows the cross-level interaction specification for the latent variable model. Both the intercept and effect of perceived dangerousness of climate change are allowed to vary across countries, while all other covariates are fixed. The systematic differences in the intercept and effect of perceived dangerousness are predicted by the natural logarithm of GDP per capita or Human Development Index (HDI) score. And the covariance between the intercept and effect is estimated as part of the model.

$$(2)\ (environment\ important\ issue)_i^{*} \sim (\alpha_{j[i]} + \beta_{1k} * dangerousness_{i[k]} + \beta_2 * left + \beta_3 * right + \beta_4 * education + \beta_5 * education + \beta_6 * age30-39 + \beta_7 * age40-49 + \beta_8 * age50-59 + \beta_9 * age60-69 + \beta_{10} * age \geq 70, \sigma_y^2)$$

$$\begin{bmatrix} \alpha_k \\ \beta_{1k} \end{bmatrix} \sim N\left(\begin{bmatrix} \gamma_{00} + \gamma_{01} * GDP\ per\ capita/HDI \\ \delta_{00} + \delta_{01} * GDP\ per\ capita/HDI \end{bmatrix}, \Sigma\right)$$

$$\sum = \begin{bmatrix} \sigma_\alpha^2 & \sigma_\alpha\sigma_\beta \\ \sigma_\alpha\sigma_\beta & \sigma_\beta^2 \end{bmatrix}$$

The results are presented in Table 7.3. Models 1-3 allow each country's intercept to vary in random-intercept models. Models 4-6 allow both the intercept and coefficient for dangerousness of climate change to vary across countries, in random-intercept, random coefficient models. Unsurprisingly, an individual's perceived dangerousness of climate change is significantly related to the probability of saying the environment is one of the two most important issues facing his or her country. An individual who considers climate change "extremely dangerous" is predicted to be about seven percent more likely to say the environment is an important issue than an individual who considers climate change "not dangerous at all" across all 30 countries. Even though risk perception has the strongest statistical influence of all of the individual-level predictors included in the model, its substantive influence is surprisingly weak, considering the expectation that those who see climate change as a large risk would be more likely to say the environment is a most important issue.

The modest effect of the perceived dangerousness of climate change across all countries does not tell the whole story though. Models 1-3 show that there is significant variation in ranking the environment as an important issue across countries. And Model 4, which allows the coefficient estimate for perceived dangerousness of climate change to vary across countries, shows that there is significant and meaningful variation in the influence of perceived dangerousness of climate change on considering the environment an important issue across countries.[16] Models 5 and 6 in Table 2.4 then model this variation in the effect

[16] The Akaike Information Criterion (AIC) for Model 4, the random-intercept, random-coefficient model, decreases by 84 compared Model 1, the random-intercept model, showing that allowing climate change risk perception to vary across countries provides superior model fit.

of perceived dangerousness of climate change across countries by estimating cross-level interaction models. Specifically, the models include interaction terms for perceived dangerousness of climate change and the natural logarithm of GDP per capita in Model 5 and perceived dangerousness of climate change and HDI in Model 6. The results show that climate change risk perception has a strong influence on ranking the environment as a most important issue in very rich and developed countries. Figure 2.7 shows the difference in predicted probability between those who say climate change is “very dangerous” and those who say “not very dangerous” for ranking the environment important across values of GDP per capita. When GDP per capita is about $3,000, perceived dangerousness of climate change does not significantly predict ranking the environment as important, as the predicted probability for both “very dangerous” and “not very dangerous” is about three percent. But in a rich country, in which GDP per capita is about $36,000, individuals who said “very dangerous” were about eight percent more likely to rank the environment as more important than individuals who said “not very dangerous”. Specifically, when GDP per capita is $36000, an individual who considers climate change “very dangerous” is predicted to be 19 percent likely to rank the environment as important, compared to 11 percent for an individual who considers climate change “not very dangerous”.

Table 7.3: Random-intercept, random-coefficient binary logistic models predicting considering the environment the most or next most important issue (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Dangerousness of climate change	**0.2765**	**0.2771**	**0.2770**	**0.2162**	**-1.2310**	**-1.0878**
	(0.0399)	(0.0399)	(0.0399)	(0.0441)	(0.3469)	(0.2986)
Left party identification	0.1130	0.1126	0.1138	0.1082	0.1081	0.1092
	(0.0680)	(0.0677)	(0.0677)	(0.0670)	(0.0669)	(0.0669)
Right party identification	**-0.2931**	**-0.2944**	**-0.2929**	**-0.2759**	**-0.2770**	**-0.2757**
	(0.0674)	(0.0672)	(0.0673)	(0.0671)	(0.0669)	(0.0671)
Level of education	**0.0575**	**0.0573**	**0.0568**	**0.0551**	**0.0552**	**0.0548**
	(0.0183)	(0.0183)	(0.0183)	(0.0181)	(0.0182)	(0.0182)
Female	0.0606	0.0604	0.0604	0.0537	0.0533	0.0532
	(0.0505)	(0.0505)	(0.0505)	(0.0500)	(0.0500)	(0.0500)
Age younger than 30	**0.1296**	**0.1303**	**0.1307**	**0.1254**	**0.1257**	**0.1259**
	(0.0510)	(0.0508)	(0.0509)	(0.0515)	(0.0514)	(0.0514)
Age 30-39	-0.0020	-0.0016	-0.0014	-0.0061	-0.0061	-0.0061
	(0.0588)	(0.0588)	(0.0589)	(0.0584)	(0.0584)	(0.0584)
Age 50-59	0.0853	0.0849	0.0847	0.0900	0.0902	0.0899
	(0.0617)	(0.0616)	(0.0617)	(0.0611)	(0.0611)	(0.0611)
Age 60-69	0.0661	0.0654	0.0649	0.0775	0.0777	0.0770
	(0.0600)	(0.0600)	(0.0600)	(0.0594)	(0.0593)	(0.0593)
Age 70 and older	-0.0108	-0.0117	-0.0128	0.0040	0.0040	0.0030
	(0.0865)	(0.0866)	(0.0864)	(0.0864)	(0.0864)	(0.0863)
Country-level variables						
Natural logarithm of mean GDP per capita (2005-2009)		**0.7915**			**0.3521**	
		(0.1514)			(0.1405)	
Mean HDI (2005-2009)			**8.1174**			**3.4045**
			(1.6432)			(1.2589)
Cross-level interaction terms						
Climate change risk perception X Natural logarithm of mean GDP					**0.1465**	
					(0.0350)	
Climate change risk perception X Mean HDI						**1.5590**
						(0.3548)
Constant	-2.8437	-10.6771	-9.6571	-2.6432	-6.1340	-5.5131
	(0.1650)	(1.5838)	(1.4874)	(0.1507)	(1.4204)	(1.0933)
Variance components						
Country-level standard deviation	**0.8354**	**0.3167**	**0.3753**	**0.4792**	**0.3891**	**0.4217**
	(0.1579)	(0.0698)	(0.0840)	(0.1832)	(0.1732)	(0.1771)
Dangerousness of climate change standard deviation				**0.0415**	**0.0235**	**0.0240**
				(0.0116)	(0.0079)	(0.0085)
Number of respondents	37666	37666	37666	37666	37666	37666
Number of countries	30	30	30	30	30	30
AIC	28086	28060	28065	28002	27976	27981

Notes: Cell entries are logistic regression coefficients with the standard error in parenthesis for a random coefficient, random intercept model. Listwise deletion was used. **Bold** indicates two-tailed $p<0.05$. Israel and Taiwan are not included in the models because respondents were not asked for their partisan identification in these two countries.

7.5.2 Risk perception and climate change as the most important environmental problem

This section looks at the relationship between climate change risk perception and ranking climate change as the country's most important environmental problem. As expected, across all 32 countries included in the ISSP, there is a strong positive relationship between climate change risk perception and ranking climate change as the most important environmental problem; as perceived dangerousness increases, so does the probability of considering climate change the most important environmental problem. In every country, individuals who consider climate change dangerous are more likely to choose climate change as their country's most important environmental problem than those who consider climate change not dangerous.[17] In the United States, of those who say climate change is "not dangerous at all" or "not very dangerous", only about one percent called climate change America's most important environmental problem, compared to 23 percent of those who consider climate change "extremely dangerous".

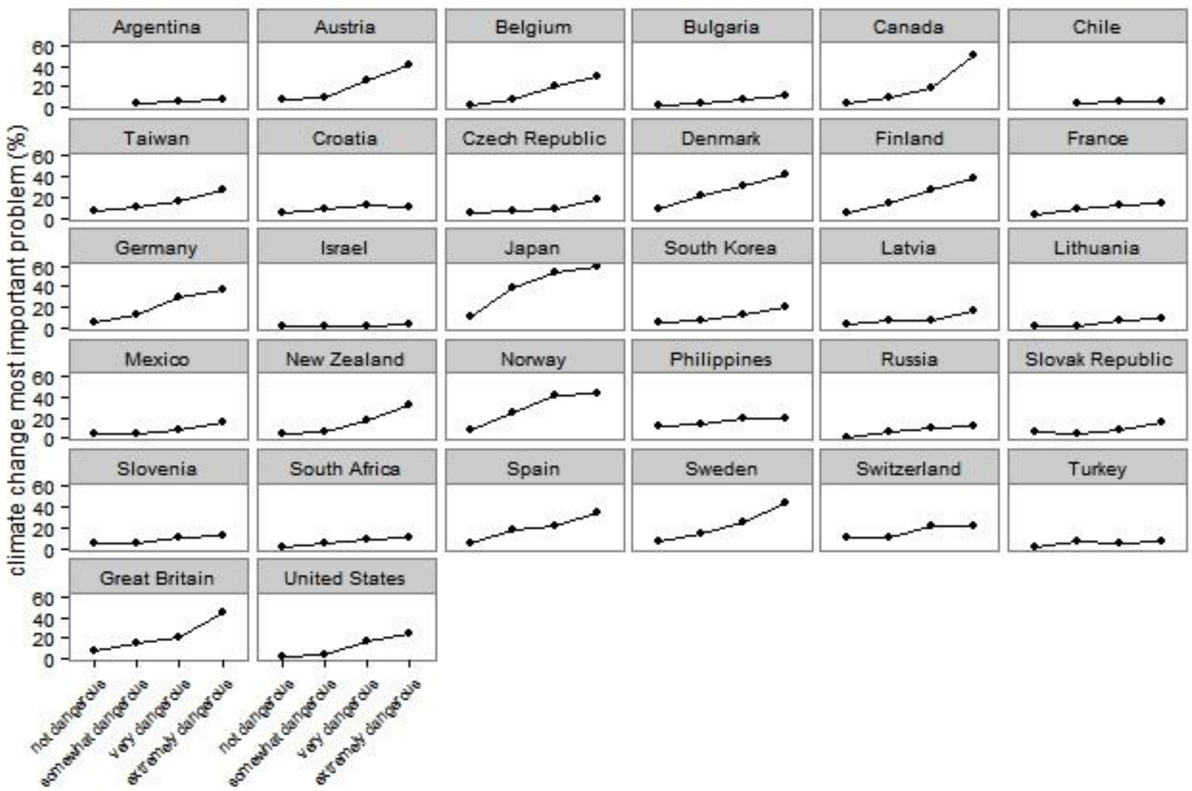
Among those most worried about climate change, however, a large majority of individuals rank another environmental problem other than climate change as the most important for their country. More individuals consistently name air pollution than climate change as the most important environment problem for their country than climate change, even among who considered climate change "very dangerous" or "extremely dangerous".[18] Of those Americans who express that climate change is "very dangerous" or "extremely dangerous", a substantial minority rank climate change as the most important environmental problem. In this group, more consider "using up natural resources" (26 percent) America's

[17] Of course, there is great variation across countries, In Israel, those who say climate change is "extremely dangerous" are only two percent more likely to rank climate change as Israel's most important environmental problem than those who say climate change is "not dangerous at all" or "not very dangerous", while in Canada and Japan, this difference is 46 and 49 percent respectively.

[18] In all 32 countries, among those who consider climate change "very dangerous", 22 percent say "air pollution" is their country's most important environmental problem. Sixteen percent rank "climate change" first among listed environmental problems. Among those who call climate change "extremely dangerous", 22 percent say "air pollution" and 22 percent say "climate change" is the most important environmental problem. In only two countries—Canada and Japan—does a majority of those who say climate change is "extremely dangerous" also say climate change is their country's most important environmental problem. In Japan, 53 percent of individuals who call climate change "very dangerous" and 60 percent of those who call climate change "extremely dangerous" answer that climate change is Japan's most important environmental problem.

most important environmental problem than “climate change” (19 percent). This reveals an important inconsistency in American public opinion on climate change. Even among those most worried about climate change, only about one-in-five ranks climate change as more important than other environmental problems, let alone more important than other general issues. Even among those who say climate change is dangerous, there is little pressure on policymakers in the United States to actually do something on climate change.

Figure 7.5: Relationship between perceived dangerousness of climate change and considering climate change the most important issue, by country (International Social Survey Programme 2009-2011)



Notes: “Not dangerous at all” and “not very dangerous” are collapsed into the category “not dangerous” to provide adequate sample sizes across the categories of perceived dangerousness. Still, in Argentina and Chile, fewer than 30 respondents say climate change is “not dangerous at all” or “not very dangerous”, so this category is dropped for these two countries.

Next, I model the choosing climate change as the most important environmental problem as a function of climate change risk perception, political partisanship, education, age, gender, and at the country-level, the natural logarithm of GDP per capita and HDI, as shown in Table 7.4. The model specification is the same as presented previously in Equation 2. Once again, the intercept and effect of perceived dangerousness of climate change are allowed to vary across countries in the random-intercept, random-effect models. And the logistic distribution is used since the dependent variable is binary (climate change is an important environmental problem or not), so the individual-level variance is fixed and not estimated. Equation 3 shows the cross-level interaction specification for the latent model.

$$(3)\ (climate\ change\ important\ problem)_i^* \sim (\alpha_{j[i]} + \beta_{1k} * dangerousness_{i[k]} + \beta_2 * left + \beta_3 * right + \beta_4 * education + \beta_5 * education + \beta_6 * age30-39 + \beta_7 * age40-49 + \beta_8 * age50-59 + \beta_9 * age60-69 + \beta_{10} * age \geq 70, \sigma_y^2)$$

$$\begin{bmatrix} \alpha_k \\ \beta_{1k} \end{bmatrix} \sim N\left(\begin{bmatrix} \gamma_{00} + \gamma_{01} * GDP\ per\ capita/HDI \\ \delta_{00} + \delta_{01} * GDP\ per\ capita/HDI \end{bmatrix}, \Sigma\right)$$

$$\sum = \begin{bmatrix} \sigma_\alpha^2 & \sigma_\alpha\sigma_\beta \\ \sigma_\alpha\sigma_\beta & \sigma_\beta^2 \end{bmatrix}$$

The results show once again that climate change risk perception predicts assessing the climate change as the most important environmental problem. An individual who says climate change is "not very dangerous" has a predicted probability of about three percent of ranking climate change as their country's most important problem, but an individual who says climate change is "extremely dangerous" has a predicted probability of 23 percent, a difference of 20 percent.

Table 7.4: Random-intercept, random-coefficient binary logistic models predicting considering climate change the most important environmental problem (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Climate change risk perception	**0.5693**	**0.5706**	**0.5703**	**0.5361**	**-1.0488**	**-0.8488**
	(0.0379)	(0.0381)	(0.0380)	(0.0438)	(0.3070)	(0.3813)
Left party identification	0.0880	0.0843	0.0862	0.0801	0.0792	0.0804
	(0.0543)	(0.0537)	(0.0533)	(0.0538)	(0.0534)	(0.0530)
Right party identification	0.0157	0.0108	0.0131	0.0258	0.0241	0.0257
	(0.0481)	(0.0482)	(0.0480)	(0.0465)	(0.0466)	(0.0463)
Education	**0.0711**	**0.0705**	**0.0703**	**0.0701**	**0.0701**	**0.0700**
	(0.0153)	(0.0151)	(0.0152)	(0.0152)	(0.0151)	(0.0151)
Female	-0.0440	-0.0444	-0.0443	-0.0493	-0.0500	-0.0499
	(0.0327)	(0.0328)	(0.0328)	(0.0343)	(0.0344)	(0.0343)
Age younger than 30	-0.0323	-0.0318	-0.0315	-0.0411	-0.0410	-0.0411
	(0.0542)	(0.0542)	(0.0542)	(0.0555)	(0.0556)	(0.0555)
Age 30-39	-0.0148	-0.0144	-0.0143	-0.0199	-0.0207	-0.0207
	(0.0613)	(0.0613)	(0.0613)	(0.0626)	(0.0627)	(0.0627)
Age 50-59	**-0.0988**	**-0.0994**	**-0.0995**	**-0.0975**	**-0.0970**	**-0.0973**
	(0.0479)	(0.0479)	(0.0479)	(0.0475)	(0.0474)	(0.0474)
Age 60-69	**-0.2328**	**-0.2337**	**-0.2339**	**-0.2276**	**-0.2269**	**-0.2276**
	(0.0480)	(0.0482)	(0.0481)	(0.0481)	(0.0481)	(0.0481)
Age 70 and older	**-0.3235**	**-0.3244**	**-0.3251**	**-0.3123**	**-0.3111**	**-0.3119**
	(0.0905)	(0.0907)	(0.0906)	(0.0912)	(0.0913)	(0.0911)
Country-level						
Natural logarithm of mean GDP per capita		**0.5898**			0.0809	
		(0.1721)			(0.1940)	
Mean HDI			**5.6253**			0.3195
			(1.6226)			(1.8792)
Cross-level interaction terms						
Climate change risk perception X Natural logarithm of GDP per capita					**0.1602**	
					(0.0309)	
Climate change risk perception X Natural logarithm of GDP per capita						**1.6547**
						(0.4446)
Constant	-3.4433	-9.2831	-8.1667	-3.3164	-4.1178	-3.5954
	(0.1441)	(1.7924)	(1.4380)	(0.1391)	(1.9442)	(1.5850)
Variance components						
Country-level standard deviation	**0.5750**	**0.2925**	**0.3581**	**0.4801**	**0.4585**	**0.4777**
	(0.1218)	(0.1016)	(0.0835)	(0.1641)	(0.1597)	(0.1625)
Climate change risk perception standard Deviation				**0.0427**	**0.0193**	**0.0215**
				(0.0133)	(0.0079)	(0.0073)
Number of respondents	37480	37480	37480	37480	37480	37480
Number of countries	30	30	30	30	30	30
AIC	28303	28285	28291	28238	28214	28221

Notes: Cell entries are logistic regression coefficients with the standard error in parenthesis for a random coefficient, random intercept model. Listwise deletion was used for missing values. **Bold** indicates two-tailed p<0.05. Israel and Taiwan were not included in the models because respondents were not asked for their partisan identification in these two countries.

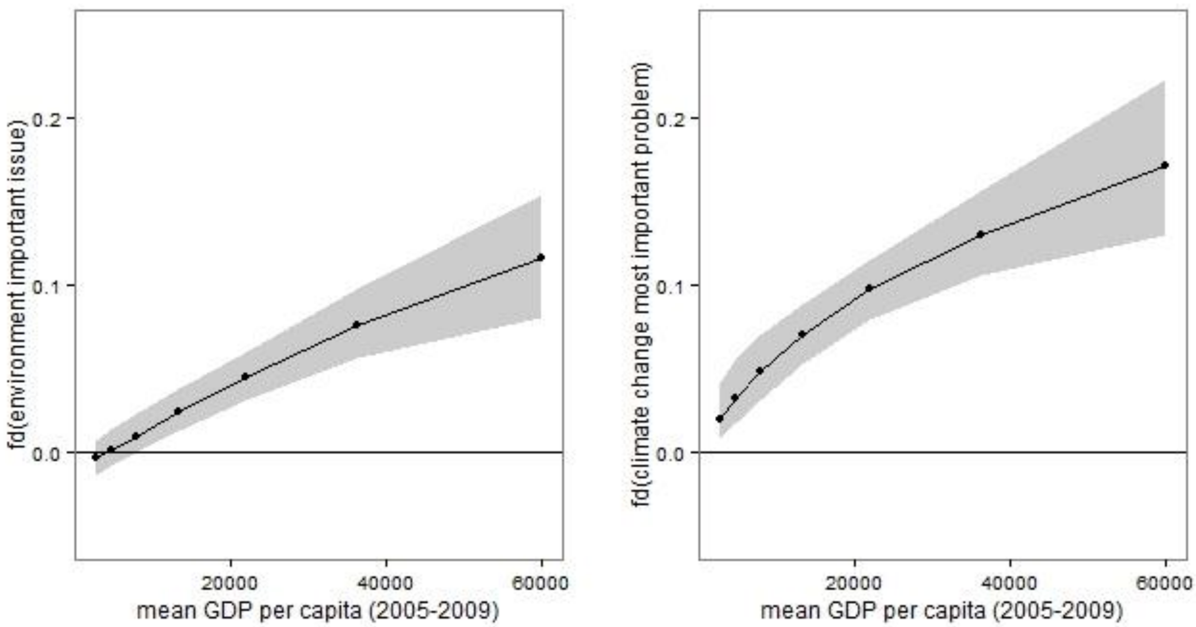
In Models 1, 2, and 3 in Table 7.4 show that country-level variation in choosing climate change as the most important environmental problem facing their country is significant. Model 4 allows the coefficient estimate for perceived dangerousness of climate change to vary across countries in addition to the constant, and the variation of perceived dangerousness is statistically significant.[19] So the strength of the relationship between the perceived dangerousness of climate change and answering that climate change is the most important environmental problem varies across countries. Models 5 and 6 introduce cross-level interaction terms to capture the variation in influence the perceived dangerousness of climate change across values of country wealth and development. Figure 7.6 shows the difference in predicted probability of considering climate change the most important environment problem between viewing climate change as "very dangerous" and "not very dangerous" across values of GDP per capita. Like the influence of perceived dangerousness on ranking the environment important, this gap between those worried about climate change and not worried about climate change increases as country affluence increases. Specifically, the predicted difference between "very dangerous" and "not very dangerous" is about two percent when GDP per capita is about $3000. But when GDP per capita is about $36000, this predicted difference is about 13 percent. Climate change risk perception has a much stronger influence on ranking climate change the most important environmental problem in rich and developed countries than in poorer and less developed countries.

Why is climate change risk perception more strongly related to ranking climate change as important in richer countries than in poorer countries? Individuals not worried about climate change are highly unlikely to rank climate change as their country's most important environment problem regardless of context. For those individuals who respond that climate change is "not very dangerous", the predicted probability for considering climate change the most important environmental problem facing their country is four percent with GDP per capita at about $3000 and only six percent with GDP per capita is $36000. This minor difference is not statistically significant. But among those who say climate change is "very

[19] The AIC decreases by 65 decreased in Model 4 compared by Model 1, suggesting that the random intercept and coefficient model provides a better fit than the random-intercept model.

dangerous", the predicted probability of considering climate change the most important environment problem increases from five percent with GDP per capita at $3000 to 20 percent with GDP per capita at $36000, a change of 15 percent.[20]

Figure 7.6: Conditional effect of perceived dangerousness of climate change on predicting considering the environment an important issue and climate change the most important environmental problem across values of mean GDP per capita (International Social Survey Programme 2009-2011)



Notes: The first differences are calculated by holding education at its female, 40-49 year-olds with no partisan identification and mean education. The first difference is calculated: pr(very dangerous) – pr(not very dangerous). The ribbon represents the 95 percent confidence interval.

This section shows that climate change risk perception has a varying influence across countries on ranking the environment and climate change as most important. Specifically, climate change risk

[20] To check the results of the cross-level interaction models, I estimated logistic regression models predicting considering climate change an important environmental problem for each of the 30 countries. The results are presented in Appendix E, which plots the difference between very dangerous and not very dangerous in the predicted probability of considering climate change the most important environmental problem across values of HDI, a measure of wealth and development. The relationship is statistically significant for all 16 countries with a mean GDP per capita greater than $16000. And it the relationship is particularly strong in some wealthy countries. For example, an individual who says climate change is very dangerous has a predicted probability 22 percent and 21 percent greater of ranking climate change as the most important environmental problem than an individual who says climate change is not very dangerous in Japan and Norway, respectively. The United States has one of the weakest associations of all the wealthy countries. An American who says climate change is not very dangerous has a predicted probability of ranking climate change as most important of less than one percent; the predicted probability for an American who says climate change is very dangerous is about four percent.

perception has a much stronger relationship with ranking the environment and climate change as most important in rich and developed countries than in poorer and less developed countries. In poorer and less developed countries, citizens are very unlikely to view the environment and climate change as more important than other issues, regardless of their level of concern about climate change. In Chapter 2, I show that many in developing countries say they are very worried about climate change, but this high level of worry might be misleading, especially in less wealthy countries. Citizens in these poorer countries, even if they respond that climate change is serious or dangerous, overwhelmingly care more about other issues and environmental problems. The relationship between climate change risk perception and ranking the environment and climate change as most important is weak in the developing world. This finding is noteworthy considering climate change is likely to have disproportionate consequences for the developing countries, and publics in these countries do not seem to be putting the necessary pressure on their governments to prepare.

7.6 Discussion and conclusion

This chapter analyzes how individuals relate their climate change risk perception to their risk perception of other environmental issues and then to other attitudes and behaviors on climate change. On these questions, the American public closely mirrors the global public. First, this chapter shows that Americans and individuals around the world relate climate change to other environmental problems; individuals who think climate change is dangerous also think other environmental problems, such as air pollution are dangerous. And for citizens in most countries, the perceived dangerousness of climate change is strongly correlated with the perceived dangerousness of air pollution. I argue this finding presents a different path for policymakers seeking to address climate change. Instead of narrowly framing fighting climate change with a focus only on the mitigating the devastating consequences of climate change, they should frame climate change as part of broader environmentalism. As shown in Chapter 2, individuals see air pollution as more dangerous and serious than climate change. People generally want to enjoy the environment around them and an environment that allows them to be healthy. Policymakers need to show how fighting climate change also helps individuals receive these benefits they can see and feel, while also mitigating the damaging long-term consequences of climate change that they cannot see and feel. This approach would be more effective communication strategy for policymakers seeking to rally the public.

But this chapter also shows that perceived dangerousness of climate change is positively correlated with perceived dangerousness of nuclear power stations, even though nuclear power could be an important part of any policy response to reduce carbon emissions, both in America and cross-nationally. Specifically, most of those who consider climate change dangerous also consider nuclear power dangerous, so those most worried about climate change are also those most likely to reject any expansion of nuclear power. This part of the public could be a major obstacle, and they would need to be convinced that nuclear power is not dangerous.

Next, this chapter explores the relationship between climate change risk perception and arguably more important attitudes and behaviors: willingness to pay to address climate change, ranking the environment as one of the two most important national issues, and ranking climate change as the most important national environmental problem. In both the United States and globally, among those who see climate change as a serious risk, there is a substantial minority that was not willing to pay higher prices, and large majorities consider issues other than the environment and environmental problems other than climate change more important. This is alarming. Assuming that citizens who tell a survey interviewer that climate change is dangerous and serious deeply care about climate change are ready to accept sacrifices is at best problematic. For many of these so-called concerned citizens, climate change is not a pressing issue, but instead a passive one. This also shows that the heated rhetoric coming from climate change activists might not even be convincing their own side. Scholars of American public opinion on climate change have argued that the impassionate rhetoric has done little to persuade those not worried about climate change (Guber 2013, Ansolabehere and Konisky 2014). This chapter also shows that the rhetorical approach of those passionate about acting on climate change might not be convincing those already on their side, both in the United States and globally. There is a small group in the United States and around the world that passionately cares about climate change. The problem is that this group is not big enough to influence policy. There is a larger group of people, who are concerned about climate change, but unwilling to go beyond expressing that it is a serious or dangerous problem. Climate change activists need a new communication approach, focusing on convincing these concerned but not alarmed individuals.

Finally, this chapter shows that climate change risk perception has a weak relationship with these attitudes and intended behaviors in less affluent and developing countries. In these countries, citizens are highly unlikely to consider the environment and climate change most important, regardless of their level of worry. So the group of individuals who say climate change is dangerous but unwilling to take the next step is even larger in these relatively poorer countries than in rich countries. This finding should is worrying, as the public in these countries might not support needed policy changes to address the consequences of climate change.

Chapter 8: Conclusion

8.1 Introduction

If climate change is the most important public policy challenge facing the world in the 21st century, then understanding what the public, not only in the United States but also around the world, thinks about climate change is valuable. Public attitudes and policy preferences about climate change will shape domestic and international policy responses. Yet as this project shows through focusing on specifically on public attitudes on climate change, the state of cross-national public opinion on climate change is complex. What the global public thinks about climate change is not clear because of its multifaceted nature. Cross-national public opinion on climate change may both help and hinder a meaningful policy response.

8.2 Obstacles to policy

How does global public opinion on climate change serve as an obstacle to climate change policy? I argue there are three primary barriers: the publics in the United States and other countries do not consider climate change an important issue or problem, citizens in wealthier countries are not more concerned about climate change or more willing to make economic sacrifices for climate change than citizens of poorer countries, and specifically many on the American right do not consider climate change serious and dangerous.

- Even though much of the world expresses that climate change is serious and dangerous in the abstract, the global public considers other issues and environmental problems as more important. People around the world rank the economy and health care as more important than the environment and environmental problems such as air and water pollution as more important than climate change, as demonstrated in Chapters 2 and 7. Even among those who say climate change is dangerous in the abstract, only a small minority rank the environment and climate change as important. And citizens of developing countries are particularly likely to focus on other issues, as climate change risk perception has a weak relationship with ranking climate change as important.

For responsive policymakers, the public's priorities seem clear: concentrate on other issues the public cares more about. Neglecting climate change does not seem likely to alienate the public.

- In a likely international policy response, the wealthy countries of Western Europe and North America would have to lead and take on a greater share of the economic costs. These countries are the most powerful actors in international politics. Wealthy countries are also the greatest emitters of carbon dioxide emissions, benefited most from fossil fuels in developing their affluent economies, yet developing countries figure to be most at risk for the damaging consequences of climate change. But, as shown in Chapters 3 and 7, citizens in affluent countries are not more or less likely to say climate change is serious or more willing to pay higher prices to address climate change than citizens in developing countries. And Chapter 5 demonstrates that the strength of left-right political orientation increases as country affluence increases. In wealthy countries, left-right political orientation has a significant effect on perceived seriousness of climate change. So climate change has become more closely associated with political and economic ideology in wealthy countries.
- The United States is the second largest emitter of absolute carbon dioxide emissions, behind China, and second largest emitter of carbon dioxide emissions per capita behind Canada. In an international policy response that meaningfully addresses climate change, the United States will have to reduce its carbon dioxide emissions. Yet, most of the American right, both elites and the mass public, will not support such a step. Prominent American Republicans reject climate science and consider climate change unserious, and most of the like-minded public seems to be using Republican elites as a cue. As Chapter 6 shows, the more engaged conservatives are in the United States, the less serious they consider climate change and the less likely they are to accept that human behavior causes climate change. Most conservatives in the United States will reject any policy designed to address climate change. Even though President Obama may have legal authority to reduce carbon dioxide emissions from power plants, his ability to go further is limited by conservative and Republican strongly-held opinions on climate change. It is hard to

imagine a major international agreement and policy response in which the United States plays a leading role. Public opinion on the right in the United States is a major obstacle.

8.3 Aides to policy

Even though public opinion on climate change is complicated, the public may also serve as a constructive force for a meaningful policy response. How? I argue that following three findings help show that the public would be supportive of meaningful policy: most people around the world are worried about climate change, greater engagement is associated with greater worry about climate change cross-nationally, and in the United States, Americans who say climate change is not serious or dangerous and reject human-caused climate change are in the minority.

- Across all cross-national surveys, an overwhelming majority of people across dozens of countries expressed that climate change is serious and dangerous in the abstract. As Chapter 2 demonstrated, across four Pew Global Attitudes surveys from 2007 to 2010, at least 87 percent of all respondents call climate change “somewhat serious” or “very serious”. Another 89 percent call climate change “somewhat serious” or “very serious” in the World Values Survey conducted from 2009 to 2011. And 90 percent of respondents in the International Social Survey Programme call climate change “somewhat dangerous”, “very dangerous”, or “extremely dangerous”. And in each country included in these surveys large majorities say climate change is serious or dangerous. Only a small fraction of respondents in these cross-national surveys say climate change is not serious or dangerous. Even though climate change is not an everyday, immediate problem for most people, most still express worry. Although the public might not demand a substantial policy response, they would likely support meaningful policy changes.
- Individuals most likely to be engaged with climate change are also the most likely to think climate change is serious and rank it as the most important environmental problem. As Chapters 3 and 7 demonstrate, those with greater education are more likely than those with less education to say climate change is a serious problem, the environment is one of their country’s top two issues, and climate change is their country’s most important environmental problem. And self-described

interest in politics increases perceived seriousness of climate change. Those with more education and greater interest in politics are probably the most likely to be closely following climate change. Those most engaged with climate change are a natural base of public support for policy change, and across many countries, those most engaged are most likely to view climate change as important and concerning. The major exception, of course, is the United States.[96]

- Although the American public clearly stands out for its lack of concern, those who say climate change is not serious or concerning are in the minority in the United States. Less than three-in-ten Americans consider climate change not serious or dangerous in these cross-national surveys. And although conservatives are far less likely than liberals to view climate change as serious or dangerous, conservative opinions on climate change are not uniform. Many Americans who describe themselves as somewhat conservative express that climate change is serious, and moderate Americans are even more likely to say climate change is serious. An alliance of liberals, moderates, and moderate conservatives might push a policy response in the future in the United States. And a response from the United State could ignite international policy changes.

8.4 A General policy response the global public would support

Broadly, how should policymakers and climate change activists frame a policy response for the public? The international public does not seem to be strongly calling for policy change, so designing a public response to maximize public support around the world is important. Politicians in democracies should be especially aware of public opinion on climate change. This project has general insights into what factors should play an important role in shaping domestic and international policy.

First, policy should be tied broadly to environmentalism and not specifically to climate change. People say other environmental problems, including local air and water pollution, are more serious and dangerous than about climate change. Moreover, as shown in Chapter 7, the perceived dangerousness of

[96] Research, such as Chapter 6, has shown that the effect of engagement is conditional on ideology and partisanship in the United States. For liberals and Democrats, engagement increases concern and also the probability of accepting climate change is the result of human activity. For conservatives and Republicans, engagement decreases concern and the probability of accepting climate change is the result of human activity.

climate change is closely related to the perceived dangerousness of air and water pollution. Obviously a policy response to mitigate the consequences of climate change needs to focus on reducing carbon dioxide emissions (Nordhaus 2013). But this policy response can also include other positive externalities for the environment. The policy response should not only address demands for improved local air and water quality, but also be framed so these improvements are consequential. For example, any policy response to climate change requires reducing carbon dioxide emissions from power plants, as power plants are a major source of carbon dioxide emissions. This requirement, no matter what the type of policy, puts increased costs on power plants, which they then pass onto consumers. Instead of framing these policy changes for power plants as designed to solely address climate change, policymakers and activists should also highlight how these changes would improve the local environment around the power plant too.[97] Consumers might believe they are receiving increased benefits for the increased costs. Policy changes to address climate change have a host of positive externalities for the environment. These externalities are important to the public and should not be ignored and deemphasized.

Second, a vast majority of people across many countries signaled that they would not support any policy response that expands the use of nuclear power. Across 32 countries in the ISSP, about 85 percent of individuals called nuclear power plants "somewhat dangerous", "very dangerous", or "extremely dangerous", and in the United States, 79 percent of Americans called nuclear power plants "somewhat dangerous", "very dangerous", or "extremely dangerous". Moreover, as Chapter 7 demonstrates, perceived dangerousness of climate change is positive related to perceived dangerousness of nuclear power plants; those who say climate change is dangerous are also likely to say nuclear power plants are dangerous. So any policy response will have to rely on the expansion of energy sources other than nuclear power which do not produce carbon dioxide emissions, like wind and solar. Wind and solar are probably more popular, but also probably more difficult to develop on a large-scale.

[97] Ansolabehere and Konisky (2014) argue that Americans are more supportive of government regulation to reduce carbon emissions than the so-called cap-and-trade plan, because they associate government regulation with previous efforts to improve environmental quality, while cap-and-trade is associated only with climate change.

Third, cross-nationally, most likely people will be sensitive to prices and reluctant to accept major economic sacrifices to address climate change. The economy is the primary issue of consequence around the world. And, as Chapter 7 shows, many of those who consider climate change serious are unwilling to agree to pay higher prices when answering a survey question. This is a problem because the energy technologies, such as wind, solar, and nuclear, which do not emit carbon dioxide emissions, are also likely to be more expensive than fossil fuels. How much of an economic sacrifice the public will accept is unclear and more research is needed in this area. In addition, policymakers will need to design ways to reduce costs for consumers, and technology will need to be developed and expanded to make clean energy sources more affordable.

8.5 Future research

Although this project tackles many questions of public opinion on climate change, there were still questions left unanswered that could be tackled in future projects. Here I highlight two potential avenues for return to build on this project.

First, this project focused on substantive attitudes about climate change, such as risk perception, and largely ignored policy preferences. In this conclusion I infer what type of policy responses people would support through their substantive attitudes, but researchers should increasingly ask respondents about their policy preferences toward climate change and reducing carbon emissions. Climate change policies are even more complex and abstract that the problem of climate change itself, but even weakly formed policy preferences are important. After all, substantive attitudes, such as considering climate change serious or important, might not translate to support for certain policy preferences, like cap-and-trade or increased regulation. It would be helpful to know two dimensions of public support for policy. First, what type of policies would the public support? Policy responses include both mitigation policies designed to curb carbon emissions and adaptation policies designed to deal with climate change. Mitigation policy could include stick-like measures such as regulation and taxes designed to make carbon emissions more expensive. Does the public support these measures? Mitigation policy could also include carrot approaches, such as tax breaks for energy sources that do not emit carbon emissions, such as water, wind, solar, and nuclear, so-called clean energy industries. Does the public support these measures? How does the public evaluate and balance stick and carrot approaches to mitigation policy? Second, any climate change policy will include increased costs for the public. What specific increased cost, if any, would citizens be willing to pay? Although scholars of public opinion on climate change in the United States are starting to focus on policy preferences toward climate change (Krosnick and MacInnis 2013), researchers have not focused on policy preferences in cross-national surveys. Considering climate change requires an international policy response, it is important to know specifically what people around the world think of policy options.

Second, this project and others have looked at factors that condition the relationship of ideology and partisanship with views on climate change. This project specifically looks at measures of engagement, such as knowledge and interest, while others have examined education (Hamilton 2011, McCright 2011) and income (Bohr 2014). I also compare this conditional relationship in the United States to other countries. But with few exceptions (see Kahan, et al. 2012), researchers have not explored the conditional and unconditional effect of science knowledge on left-right political orientation in the United States and cross-nationally.[98] Engagement with politics and engagement with science are different, so they might not even be related. Does science knowledge increase concern about climate change cross-nationally? Does it have a conditional effect, like political engagement, in the United States? Does a conditional effect exist in other countries? This type of research would improve understanding as to how people form opinions on complex science and environment issues in the United States and around the world.

8.6 Public opinion and policy

In January 2012, United States President Barack Obama called for action on climate change in his second inaugural address.

[98] Kahan and his co-authors (2012) focus on the interaction between science knowledge and values, not science knowledge and partisanship/ideology, in the United States.

> "We will respond to the threat of climate change, knowing that the failure to do so would betray our children and future generations. Some may still deny the overwhelming judgment of science, but none can avoid the devastating impact of raging fires, and crippling drought, and more powerful storms. The path towards sustainable energy sources will be long and sometimes difficult. But America cannot resist this transition; we must lead it."

But President Obama and other political leaders cannot go it alone. As V.O. Key observed more than 50 years ago, in a democracy like the United States, how and if we respond to climate change is determined by public opinion. So understanding how the public, in the United States and around the world, thinks about climate change is important to understanding what could be the one of the most important policy challenge of the 21st century. This project provides a detailed description and explanation of global public opinion on this challenge.

APPENDICIES

Appendix A: Data, survey questions, measurement, and variables

Data Sources

This project draws from multiple public opinion surveys, conducted in multiple countries and in just the United States. Here I briefly describe each survey and also how the surveys are sued throughout the project.

World Values Survey (2005-2009) (WVS)

The World Values Survey (WVS) is cross-national survey that studies the beliefs, values, and opinions of people around the world. The WVS conducts surveys in a wide range of countries at every level of development in every region of the world. The sample for each country designed to be nationally representative of the population 18 years and older. Face-to-face interviews are the primary mode of data collection, although phone interviews are sometimes used for remote areas. The minimum sample size is 1000. Weights based on demographics are used in some countries.

This project draws from wave 5 of the WVS, conducted between 2005 and 2009. Wave 5 asked respondents in 44 countries for the perceived seriousness of climate change.

Table A1.1: Participating countries and sample information for the World Values Survey (2005-2009)

Participating country	Fieldwork date	Sample size	Nationally representative sample?	Availability of survey weights?
Argentina	June 24 – July 20, 2007	1002	Yes	Yes
Australia	September 14-December 21, 2005	1421	Yes	No
Brazil	November 1 – December 26, 2006	1500	Yes	Yes
Bulgaria	May 2007	1001	Yes	Yes
Burkina Faso	March 16-25, 2007	1534	Yes	Yes
Canada	February 14 – April 6, 2006	2164	Yes	Yes
Chile	June 14-24, 2006	1000	Yes	Yes
China	March 25 – May 10, 2007	2015	Adults between the ages of 18 and 70	Yes

Table A1.1 (cont'd)

Cyprus	February – March, 2006	1050	No; adults between the ages of 18 and 70	Yes
Egypt	March 15 – April 5, 2008	3015	Yes	Yes
Ethiopia	March 26 – April 6, 2008	1500	Yes	Yes
Finland	August 28 – October 10, 2005	1014	Yes	Yes
Georgia	January 30 – February 10, 2009	1500	Yes	No
Germany	May 2 – June 21, 2006	2064	Yes	Yes
Ghana	February 19 – April 4, 2007	1534	Yes	Yes
India	December 2006 – January 2007	2001	Yes; 18 of 28 states accounting for 97 percent of population	No
Indonesia	June – October 2006	2015	Yes	Yes
Italy	May 10 – October 20, 2005	1012	Yes; adults between the ages of 18 and 75	Yes
Japan	July 7 – August 5, 2005	1096	Yes	No
Jordan	May – June 2007	1200	Yes	Yes
Malaysia	September 20 – November 15, 2006	1201	Yes	No
Mali	March 16 – March 22, 2007	1534	Yes	Yes
Mexico	November – December, 2005	1560	Yes	Yes
Moldova	November 18-30, 2006	1046	Yes	No

Table A1.1 (cont'd)

Morocco	September 15 – October 7, 2007	1200	Yes	Yes
Norway	March 5 – May 31, 2007	1025	Yes	No
Peru	December 7 -15, 2006	1500	Yes	Yes
Poland	December 2005	1000	Yes	Yes
Romania	September 15 – October 15, 2005	1776	Yes	No
Rwanda	June 9 – July 2, 2007	1507	Yes	Yes
Slovenia	October – November 2005	1037	Yes	No
South Africa	November 22 – December 20, 2006	2988	Yes	Yes
South Korea	December 1-15, 2005	1200	Yes (20 years and older instead of 18)	Yes
Spain	July 10-24, 2007	1200	Yes	Yes
Sweden	November 23, 2005 – February 17, 2006	1003	Yes	Yes
Switzerland	April – August 2007	1241	Yes, adults between the ages of 18 and 85	No
Thailand	June – July 2007	1534	Yes	No
Trinidad	September 14-November 8, 2006	1002	Yes	Yes
Turkey	January 28 – March 5, 2007	1346	Yes	Yes
Ukraine	November 15-25, 2006	1000	Yes	Yes
United States	September 19-29, 2006	1249	Yes	Yes

Table A1.1 (cont'd)

Uruguay	October 27 – November 21, 2006	1000	Yes	No
Vietnam	October 1 – November 30, 2006	1495	Yes	No
Zambia	March 30 – April 14, 2007	1500	Yes	Yes

International Social Science Programme (ISSP) (2009-2011)

A program of cross-national collaboration on surveys related to important topics in social science research. In 2009-2011, a module of questions about the environment was asked in participating countries.

Some countries include survey weights so the sample is representative of the population. Countries with samples which are not weighted to the population are Argentina, Croatia, Denmark, Israel, Japan, Latvia, New Zealand, Norway, Slovenia, South Korea, Sweden, Switzerland, and Turkey. Countries which include survey weights are Austria, Belgium, Bulgaria, Canada, Chile, Czech Republic, Finland, France, Germany, Great Britain, Lithuania, Mexico, Philippines, Russia, Slovak Republic, South Africa, Spain, and the United States. All samples were designed to be nationally representative of adult citizens. All countries have a sample size of at least 928. Table A1.2 provide more information on the 2009-2011 ISSP.

Table A1.2: Participating countries and sample information for the International Social Science Programme Survey (2009-2011)

Participating country	**Fieldwork date**	**Sample size**	**Nationally representative sample?**	**Availability of survey weights?**
Argentina	2010	1130	Yes	No
Austria	2010	1019	Yes	Yes
Belgium	2010	1142	Yes	Yes
Bulgaria	2011	1003	Yes	Yes
Canada	2011	985	Yes	Yes
Chile	2010	1436	Yes	Yes
Croatia	2011	1210	Yes	No
Czech Republic	2010	1428	Yes	Yes
Denmark	2010/2011	1305	Yes	No
Finland	2010/2011	1211	Yes	No

Table A1.2 (cont’d)

France	2010	2253	Yes	Yes
Germany	2010	1407	Yes	Yes
Great Britain	2010	928	Yes	Yes
Israel	2011	1216	Yes	No
Japan	2010	1307	Yes	No
Latvia	2011	1000	Yes	No
Lithuania	2010/2011	1023	Yes	Yes
Mexico	2011	1637	Yes	Yes
New Zealand	2010	1172	Yes	No
Norway	2011	1382	Yes	No
Philippines	2009/2010	1200	Yes	Yes
Russia	2010	1619	Yes	Yes
Slovak Republic	2009	1159	Yes	Yes
Slovenia	2011	1082	Yes	No
South Africa	2010	3112	Yes	Yes
South Korea	2010	1576	Yes	No
Spain	2010	2560	Yes	Yes
Sweden	2010	1181	Yes	No
Switzerland	2011	1212	Yes	No
Taiwan	2010	2209	Yes	Yes
Turkey	2010	1665	Yes	No
United States	2010	1430	Yes	Yes

Pew Global Attitudes Survey 2007

The Pew Global Attitudes Survey was administered in 47 countries in 2007. The survey was administered through telephone and face-to-face interviews. All of the country surveys were based on national adult samples except for Bolivia, Brazil, China, India, Ivory Coast, Pakistan, South Africa, and Venezuela. In these countries, the samples were disproportionately or exclusively urban. African countries were not included in the analysis because respondents in these countries were not asked about the level of seriousness of climate change.

Table A1.3: Participating countries and sample information for the Pew Global Attitudes Survey (2007)

Participating country	Fieldwork date	Sample size	Nationally representative sample?
Argentina	April 13-23, 2007	800	Yes
Bangladesh	April 11-30, 2007	1000	Yes
Bolivia	April 14-May 1, 2007	834	No, the sample was disproportionally urban
Brazil	April 12-May 5, 2007	1000	No, the sample was disproportionally urban
Britain	April 21-May 6, 2007	1002	Yes, representative of households with telephones
Bulgaria	April 13-May 7, 2007	500	Yes
Canada	April 16-April 26, 2007	1004	Yes, representative of households with telephones
Chile	April 18-27, 2007	800	Yes
China	April 20-30, 2007	3142	No, the sample was disproportionally urban
Czech Republic	April 11-May 4, 2007	900	Yes, representative of households with telephones
Egypt	April 9-May 7, 2007	1000	Yes
Ethiopia*	April 27-May7, 2007	710	Yes, except for area near Somali border

Table A1.3 (cont'd)

France	April 13-18, 2007	1004	Yes, representative of households with telephones
Germany	April 16-30, 2007	1000	Yes, representative of households with telephones
Ghana*	April 25-May 3, 2007	707	Yes
India	April 20-May 17, 2007	2043	No, the sample was disproportionally urban
Indonesia	April 18-28, 2007	1008	Yes, except for extremely remote areas
Israel	April 20-May 11, 2007	900	Yes
Italy	April 18-May 23, 2007	501	Yes
Ivory Coast*	April 12-16, 2007	700	No, the sample was disproportionally urban
Japan	April 6-May 23, 2007	762	Yes
Jordan	April 9-May 7, 2007	1000	Yes
Kenya*	April 20-30, 2007	1000	Yes
Kuwait	April 15-May 10, 2007	500	Yes
Lebanon	April 9-May7, 2007	1000	Yes
Malaysia	April 13 – May 9, 2007	700	Yes, except for extremely remote areas
Mali*	April 7 – April 18, 2007	700	Yes

Table A1.3 (cont'd)

Mexico	April 13-27, 2007	828	Yes
Morocco	April 20-May10, 2007	1000	Yes
Nigeria*	April 23-May 29, 2007	1128	Yes
Pakistan	April 18 – May 10, 2007	2008	No, the sample was disproportionally urban and excluded areas of instability
Palestinian Territories	April 21-30, 2007	808	Yes
Peru	April 13-29, 2007	800	Yes
Poland	April 12-26, 2007	504	Yes
Russia	April 10-24, 2007	1002	Yes
Senegal*	April 14-19, 2007	700	Yes
Slovakia	April 11 – May 6, 2007	900	Yes, representative of households with telephones
South Africa*	April 20 – May 20, 2007	1000	No, exclusively urban
South Korea	April 9-24, 2007	718	Yes
Spain	April 18 – May 15, 2007	500	Yes
Sweden	April 18 – May 9, 2007	1000	Yes, representative of households with telephones
Tanzania*	April 21 – May 14, 2007	704	Yes
Turkey	April 10 – May 3, 2007	971	Yes
Uganda*	April 15-24, 2007	1122	Yes
Ukraine	April 13-24, 2007	500	Yes

Table A1.3 (cont'd)

United States	April 23 – May 6, 2007	2026	Yes, representative of households with telephones in continental U.S.
Venezuela	April 22 – May 21, 2007	803	No, the sample was disproportionally urban

*Question: "On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem?" not asked in these countries.

Pew Global Attitudes Survey 2008

Table A1.4: Participating countries and sample information for the Pew Global Attitudes Survey (2008)

Participating country	Fieldwork date	Sample size	Nationally representative sample?
Argentina	March 25 – April 3, 2008	801	Yes
Australia	March 20 – April 4, 2008	700	Yes
Brazil	March 20 – April 8, 2008	1000	No, the sample was disproportionally urban
Britain	March 17 – April 6, 2008	753	Yes, representative of households with telephones
China	March 28 – April 19, 2008	3212	No, the sample was disproportionally urban
Egypt	March 19 – April 7, 2008	1000	Yes
France	March 31 – April 8, 2008	754	Yes, representative of households with telephones

Table A1.4 (cont'd)

Germany	March 25 – April 9, 2008	750	Yes, representative of households with telephones
India	April 1-16, 2008	2056	No, the sample was disproportionally urban
Indonesia	March 29 – April 14, 2008	1000	Yes, except for extremely remote areas
Japan	March 19 – April 13, 2008	708	Yes
Jordan	March 18 – April 6, 2008	1000	Yes
Lebanon	March 19 – April 7, 2008	1000	Yes
Mexico	March 18-31, 2008	805	Yes
Nigeria	April 8-21, 2008	1000	Yes
Pakistan	April 1-19, 2008	1254	No, the sample was disproportionally urban and did not include areas of instability
Poland	March 26 – April 14, 2008	750	Yes
Russia	March 18 – April 4, 2008	1000	Yes
South Africa	March 18 – April 4, 2008	1001	Yes
South Korea	March 20-27, 2008	714	Yes
Spain	March 17 – April 17, 2008	752	Yes
Tanzania	March 31 – April 16, 2008	704	Yes

Table A1.4 (cont'd)

Turkey	March 31 – April 21, 2008	1003	Yes
United States	April 9-17, 2008	1000	Yes, representative of households with telephones in continental U.S.

Pew Global Attitudes Survey 2009

Table A1.5: Participating countries and sample information for the Pew Global Attitudes Survey (2009)

Participating country	Fieldwork date	Sample size	Nationally representative sample?
Argentina	May 18 – June 3, 2009	800	Yes
Brazil	May 18 – June 14, 2009	813	No, the sample was disproportionally urban
Britain	May 26 – June 9, 2009	754	Yes, representative of households with telephones
Canada	May 19 – June 5, 2009	750	Yes, representative of households with telephones
Chine	May 22 – June 10, 2009	3169	No, the sample was disproportionally urban
Egypt	May 24 – June 11, 2009	1000	Yes
France	May 29 – June 9, 2009	753	Yes, representative of households with telephones
Germany	May 25 – June 6, 2009	751	Yes, representative of households with telephones

Table A1.5 (cont'd)

India	May 22 – June 13, 2009	2038	No, the sample was disproportionally urban
Indonesia	May 29 – June 5, 2009	100	Yes, except for extremely remote areas
Israel	May 18 – June 16, 2009	1201	Yes
Japan	May 20 – June 10, 2009	700	Yes, representative of households with telephones
Jordan	May 24 – June 11, 2009	1000	Yes
Kenya	May 22-30, 2009	1002	Yes
Lebanon	May 20 – June 3, 2009	1000	Yes
Mexico	May 26 – June 2, 2009	1000	Yes
Nigeria	June 2-14, 2009	1000	Yes
Pakistan	May 22 - June 9, 2009	1254	No, the sample was disproportionally urban and did not include areas of instability
Palestinian territories	May 23 – June 11, 2009	1204	Yes
Poland	May 21 – June 8, 2009	750	Yes
Russia	May 20 – June 9, 2009	1001	Yes
South Korea	May 25 – June 8, 2009	750	Yes
Spain	May 25 – June 9, 2009	750	Yes, representative of households with telephones

Table A1.5 (cont'd)

Turkey	May 20 – June 15, 2009	1005	Yes
United States	May 27 – June 10, 2009	1000	Yes, representative of households with telephones in continental U.S. (including cell phone only households).

Pew Global Attitudes Survey 2010

Table A1.6: Participating countries and sample information for the Pew Global Attitudes Survey (2010)

Participating country	Fieldwork date	Sample size	Nationally representative sample?
Argentina	April 13 – May 4, 2010	803	Yes
Brazil	April 10 – May 6, 2010	1000	Yes
Britain	April 15 – May 2, 2010	750	Yes, representative of households with telephones (including cell phone only households).
China	April 9-20, 2010	3262	No, the sample was disproportionally urban
Egypt	April 12 – May 3, 2010	1000	Yes, except for extremely remote areas
France	April 15-23, 2010	752	Yes, representative of households with telephones (including cell phone only households).

Table A1.6 (cont'd)

Germany	April 15-30, 2010	750	Yes, representative of households with telephones (excluding cell phone only households)
India	April 9-30, 2010	2254	No, the sample was disproportionally urban
Indonesia	April 16-29, 2010	1000	Yes, except for extremely remote areas
Japan	April 9-26, 2010	700	Yes, representative of households with telephones (excluding cell phone only households)
Jordan	April 12 – May 3, 2010	1000	Yes
Kenya	April 9-23, 2010	1002	Yes
Lebanon	April 12 – May 3, 2010	1000	Yes
Mexico	April 14-20, May 1-6, 2010	1300	Yes
Nigeria	April 18 – May 7, 2010	1000	Yes
Pakistan	April 13- 28, 2010	2000	No, the sample was disproportionally urban
Poland	April 9 – May 8, 2010	750	Yes
Russia	April 7 – May 1, 2010	1001	Yes
South Korea	April 11-23, 2010	706	Yes

Table A1.6 (cont'd)

Spain	April 14 – May 4, 2010	755	Yes
Turkey	April 12 – April 30, 2010	1003	Yes
United States	April 15 – May 5, 2010	1002	Yes, representative of households with telephones (including cell phone only households).

Chapter 1 – How Important Do People Consider Climate Change?

- Pew Global Attitudes Survey 2007
- Pew Global Attitudes Survey 2008
- Pew Global Attitudes Survey 2009
- Pew Global Attitudes Survey 2010
- World Values Survey (2005-2009) (WVS)
- International Social Science Programme (2009-2010) (ISSP)
- Gallup Environment Polls (1997, 1999-2004, 2006-2013)
- Pew Center for the People and Press Surveys (2006-2013)

Chapter 3 – What Explains Cross-National Climate Change Risk Perception?

- World Values Survey (2005-2009) (WVS)

Chapter 4 – Where Does Left-Right Political Orientation Matter Across Countries?

- World Values Survey (2005-2009) (WVS)

Chapter 5 – Why is the American Public Far More Polarized on Climate Change than Other Wealthy Countries?

- World Values Survey (2005-2009) (WVS)
- American National Elections Study 2008 (ANES)
- American National Elections Study 2012 (ANES)

Chapter 6 – How Do People Think About Climate Change?

- Pew Global Attitudes Survey 2009
- Pew Global Attitudes Survey 2010
- International Social Science Programme (2009-2011) (ISSP)

Survey questions, measurement, and variables for all variables

Table A1.7: Chapter 1 – Survey questions, measurements, and variables

Variable Name	*Description/Question*
Gallup Surveys (1997-2013)	
Worry about climate change	I'm going to read a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. How much do you personally worry about global warming? Not at all; only a little; a fair amount; a great deal.
International Social Survey Programme (2009-2010)	
Dangerousness of climate change	"In general, do you think that a rise in the world's temperature caused by climate change is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Dangerousness of air pollution from cars	In general, do you think that air pollution caused by cars is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Dangerousness of air pollution from industry	In general do you think that air pollution caused by industry is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Dangerousness of pollution of water	And do you think that pollution of COUNTRY'S rivers, lakes, and streams is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.

Table A1.7 (cont'd)

Dangerousness of pesticides and chemicals in farming	And do you think that the pesticides and chemicals used in farming are extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Dangerousness of nuclear power stations	And do you think that nuclear power stations are extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Dangerousness of modified genetic crops risk perception	And do you think that modifying the genes in certain crops is extremely dangerous, very dangerous, somewhat dangerous, not very dangerous, or not dangerous at all for the environment?" 0=not dangerous at all; 0.25=not very dangerous; 0.5=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous.
Most important issue	Which of these issues is the most important for [COUNTRY] today? Health care; education; crime; the environment; immigration; the economy; terrorism; poverty; none of these/can't choose.
Next most important issue	Which is the next most important (issue)? Health care; education; crime; the environment; immigration; the economy; terrorism; poverty; none of these/can't choose.
Most important environment problem – country	Here is a list of some different environmental problems. Which problem, if any, do you think is the most important for [COUNTRY] as a whole? Air pollution; chemicals and pesticides; water shortage; water pollution; nuclear waste; domestic waste disposal; climate change; genetically modified crops; using up our natural resources; none of these/can't choose.
Most important environmental problem – family	Here is a list of some different environmental problems. Which problem, if any, affects you and your family the most? Air pollution; chemicals and pesticides; water shortage; water pollution; nuclear waste; domestic waste disposal; climate change; genetically modified crops; using up our natural resources; none of these/can't choose.
Pew Research Center Global Attitudes Surveys (2007-2010)	
Seriousness of climate change (2007-2009)	On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem? 0=not a problem; 0.33=not too serious; 0.67=somewhat serious; 1=very serious
Seriousness of climate change (2010)	On another topic, in your view global climate change a very serious problem, somewhat serious, not too serious, or not a problem? 0=not a problem; 0.33=not too serious; 0.67=somewhat serious; 1=very serious

Table A1.7 (cont'd)

Willingness to pay to address climate change (2009-2010)	Please tell me whether you agree or disagree with the following statement. "People should be willing to pay higher prices in order to address global climate change". Agree; disagree; don't know.
Pew Research Center for the People and the Press Surveys (2006-2013)	
Seriousness of climate change	In your view, is global warming a very serious problem, somewhat serious; not too serious; or not a problem? Not a problem; not too serious; somewhat serious; very serious.
World Values Survey (2005-2009)	
Seriousness of climate change	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or greenhouse effect. 0=not serious at all; 0.33=not very serious; 0.67=somewhat serious; 1=very serious.
Seriousness of loss of species/biodiversity	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Loss of plant or animal species or biodiversity. 0=not serious at all; 0.33=not very serious; 0.67=somewhat serious; 1=very serious.
Seriousness of pollution of water	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Pollution of rivers, lakes and streams. 0=not serious at all; 0.33=not very serious; 0.67=somewhat serious; 1=very serious.

Table A1.8: Chapter 3 – Survey questions, measurements, and variables

Variable Name	*Description/Question*	*Minimum Value*	*Maximum Variable*
World Values Survey Variables			
Seriousness of climate change	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or greenhouse effect? 1=not serious at all; 2=not very serious; 3=somewhat serious; 4=very serious	1	4
Post-materialism	12 item index: People sometimes talk about what the aims of this country should be for the next ten years. On his card are listed some of the goals which different people give top priority. Would you please say which one of these you, yourself consider the most important? And which would be the next most important? First list : a high level of economic growth; making sure this country has strong defense forces; seeing that people have more say about how things are done at their jobs and in their communities; trying to make our cities and countryside more beautiful. Second list: maintaining order in the nation; giving people more say in important government decisions; fighting rising prices; protecting freedom of speech Third list: a stable economy; progress toward a less impersonal and more humane society; progress toward a society in which ideas count more than money; the fight against crime	-2.5	2.5

Table A1.8 (cont'd)

Political ideology/left-right political orientation	In political matters, people talk of "the left" and "the right". How would you place your views on this scale, generally speaking? 1=far left; 10=far right	1	10
Right	Self-positioning on the above left-right continuum: 7-10	0	1
Left	Self-positioning on the above left-right continuum: 1-4	0	1
Social issues index	Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between. -4.5=never justifiable; 4.5=always justifiable Homosexuality Abortion Divorce Euthanasia	-4.5	4.5
Income inequality	Now I'd like you to tell me your views on various issues. How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your view fall somewhere in between, you can choose any number in between. 1=incomes should be made more equal; 10=we need larger income differences as incentives for individual effort. Recoded to be zero-centered at the midpoint.	-4.5	-4.5
Private enterprise	Now I'd like you to tell me your views on various issues. How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your view fall somewhere in between, you can choose any number in between. 1=private ownership of business and industry should be increased; 10=government ownership of business and industry should be increased. Values reversed and recoded to be zero-centered.	-4.5	4.5
Interest in politics	How interested would you say you are in politics? – -1.5=not at all interested, -0.5=not very interested, 0.5= somewhat interested, 1.5=very interested	-1.5	1.5

Table A1.8 (cont'd)

Level of education	What is the highest education level that you have attained? -3.5=no formal education -2.5=incomplete primary school -1.5=complete primary school -0.5=incomplete secondary school: technical/vocational type 0.5=complete secondary school: technical/vocational type 1.5=incomplete secondary: university-preparatory type 2.5=complete secondary: university-preparatory type 3.5=university-level education	-3.5	3.5
Attendance of religious services	Apart from weddings and funerals, about how often do you attend religious services these days? -3=never practically never; -2=less often; -1=once a year; 0=only on special holy days; 1=once a month; 2=once a week; 3=more than once a week	-3	3
Importance of God	"How important is God in your life? Please use this scale to indicate"… from "not at all important" to 'very important". -5=not at all important; 5=very important.	-5	5
Protestant	Do you belong to a religious denomination? 1=Protestant; all other response categories.	0	1
Catholic	Do you belong to a religious denomination? 1=Catholic; 0=all other responses categories.	0	1
Evangelical	Do you belong to a religious denomination? 1=Evangelical; 0=all other responses categories.	0	1
Muslim	Do you belong to a religious denomination? 1=Muslim; 0=all other responses categories.	0	1
Lower class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=lower class; 0=all other response categories.	0	1
Working class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=working class; 0=all other response categories.	0	1
Middle class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class.	0	1

	Would you describe yourself as belonging to the 1=lower middle class; 0=all other response categories.		
Upper class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=upper middle class or upper class; 0=all other response categories.	0	1
Income decile	"On this card is a scale of incomes on which 1 indicates the 'lowest income decile' and 10 the 'highest income decile' in your country. We would like to know in what group your household is. Please specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in."	1	10
Female	Respondent sex by observation. 1=female; 0=male.	0	1
Age – younger than 30	Self-identified age of respondent in years. 1= 29 and younger; 0=all other ages.	0	1
Age – 30 to 39	Self-identified age of respondent in years. 1= 30 to 39; 0=all other ages.	0	1
Age – 40 to 49	Self-identified age of respondent in years. 1= 40 to 49; 0=all other ages.	0	1
Age – 50 to 59	Self-identified age of respondent in years. 1= 50 to 59; 0=all other ages.	0	1
Age – 60 to 69	Self-identified age of respondent in years. 1= 60 to 69; 0=all other ages.	0	1
Age – 70 and older	Self-identified age of respondent in years. 1=70 and older; 0=all other ages.	0	1
<u>Country-level variables</u>			
GDP per capita	Natural logarithm of mean GDP per capita from 2005-2009 *Source*: World Bank	5.56	11.28
HDI	Mean Human Development Index score, 2005-2009. A composite measure of developing capturing educational attainment, life expectancy, and income. *Source:* United Nations Development Programme[99]	0.31	0.95

[99] In late 2013, the United Nations Development Programme (UNDP) adjusted the calculation of previous HDI scores as a result of newly available data. The data used here was collected before this adjustment, so currently available HDI scores from the UNDP are slightly different than the scores used here.

Table A1.8 (cont'd)

Oil rents per capita	Natural logarithm of mean oil and gas exports per capita by country in 2009 dollars, 2005-2009. *Source*: Ross	0	9.95
CO_2 per capita	Mean metric tons of CO_2 emissions per capita, 2005-2009 *Source*: World Bank	0.46	29.07
Polity	Mean score measuring a country's level of democracy, 2005-2009. *Source*: Polity Project	-7.0	10
GINI	Mean GINI coefficient measuring inequality from 2005-2009 *Source:* Solt	23.02	64.73

Table A1.9 Chapter 4 – Survey questions, measurements, and variables

Variable Name	*Description/Question*	*Minimum Value*	*Maximum Variable*
World Values Survey Variables			
Seriousness of climate change	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or greenhouse effect? 1=not serious at all; 2=not very serious; 3=somewhat serious; 4=very serious	1	4
Post-materialism	12 item index: People sometimes talk about what the aims of this country should be for the next ten years. On his card are listed some of the goals which different people give top priority. Would you please say which one of these you, yourself consider the most important? And which would be the next most important? First list : a high level of economic growth; making sure this country has strong defense forces; seeing that people have more say about how things are done at their jobs and in their communities; trying to make our cities and countryside more beautiful. Second list: maintaining order in the nation; giving people more say in important government decisions; fighting rising prices; protecting freedom of speech Third list: a stable economy; progress toward a less impersonal and more humane society; progress toward a society in which ideas count more than money; the fight against crime	-2.5	2.5

Table A1.9 (cont'd)

Political ideology/left-right political orientation	In political matters, people talk of "the left" and "the right". How would you place your views on this scale, generally speaking? 1=far left; 10=far right	1	10
Interest in politics	How interested would you say you are in politics? – -1.5=not at all interested, -0.5=not very interested, 0.5= somewhat interested, 1.5=very interested	-1.5	1.5
Level of education	What is the highest education level that you have attained? -3.5=no formal education -2.5=incomplete primary school -1.5=complete primary school -0.5=incomplete secondary school: technical/vocational type 0.5=complete secondary school: technical/vocational type 1.5=incomplete secondary: university-preparatory type 2.5=complete secondary: university-preparatory type 3.5=university-level education	-3.5	3.5
Attendance of religious services	Apart from weddings and funerals, about how often do you attend religious services these days? -3=never practically never; -2=less often; -1=once a year; 0=only on special holy days; 1=once a month; 2=once a week; 3=more than once a week	-3	3
Importance of God	"How important is God in your life? Please use this scale to indicate"… from "not at all important" to 'very important". -5=not at all important; 5=very important.	-5	5
Protestant	Do you belong to a religious denomination? 1=Protestant; all other response categories.	0	1
Female	Respondent sex by observation. 1=female; 0=male.	0	1
Age – younger than 30	Self-identified age of respondent in years. 1= 29 and younger; 0=all other ages.	0	1
Age – 30 to 39	Self-identified age of respondent in years. 1= 30 to 39; 0=all other ages.	0	1
Age – 40 to 49	Self-identified age of respondent in years. 1= 40 to 49; 0=all other ages.	0	1

Table A1.9 (cont'd)

Age – 50 to 59	Self-identified age of respondent in years. 1= 50 to 59; 0=all other ages.	0	1
Age – 60 to 69	Self-identified age of respondent in years. 1= 60 to 69; 0=all other ages.	0	1
Age – 70 and older	Self-identified age of respondent in years. 1=70 and older; 0=all other ages.	0	1
<u>Country-level variables</u>			
GDP per capita	Natural logarithm of mean GDP per capita from 2005-2009 *Source*: World Bank	5.56	11.28
HDI	Mean Human Development Index score, 2005-2009. A composite measure of developing capturing educational attainment, life expectancy, and income. *Source:* United Nations Development Programme[100]	0.31	0.95
OECD country	Member of the Organization for Economic Cooperation and Development (OECD) or not.	0	1
Post-communist country	Experienced a transition from communism in the early 1990s or not.	0	1

Table A1.10: Chapter 5 - Survey questions, measurements, and variables

Variable Name	*Description/Question*	*Minimum Value*	*Maximum Variable*
<u>American National Elections Study 2008</u>			
Concern about climate change	"How concerned are you about global climate change? 0=totally unconcerned; 0.25=largely unconcerned; 0.5=mildly unconcerned; 0.75=concerned; 1=very concerned (May 2008 wave)	0	1

[100] In late 2013, the United Nations Development Programme (UNDP) adjusted the calculation of previous HDI scores as a result of newly available data. The data used here was collected before this adjustment, so currently available HDI scores from the UNDP are slightly different than the scores used here.

Table A1.10 (cont'd)

Climate change belief scale	"Please read each of the sentences below and indicate to what extent you agree or disagree with that statement. Please use a zero-to-10 scale, where 0 means you completely disagree and 10 means you completely agree. 1. We are already in the first stages of global warming and climate change. 2. If the present rate of coal and oil use continues, serious long-term environmental damage will occur. 3. The dangers of global warming are being over emphasized for political reasons. 4. There is not enough scientific evidence to support claims that the Earth is getting warmer." I recoded responses to statements three and four so higher values capture greater belief in climate change. Then responses to these four questions were used to create a scale measuring climate change belief. (May 2008 wave)	0	10
Cause of climate change	"Do you think a rise in the world's temperatures is being caused mostly by things people do, mostly by natural causes, or about equally by things people do and by natural causes?" 0=mostly by natural causes or about equally by things people do and by natural causes; 1=most by things people do. (February 2008 wave)	0	1
Political ideology	When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative? 1=very liberal; 2=somewhat liberal; 3=closer to liberals; 4=neither (moderate); 5=closer to conservatives; 6=somewhat conservative; 7=very conservative (February 2008 wave).	1	7
Political knowledge	Respondents were asked six questions about their knowledge of politics: 1. Do you happen to know how many times an individual can be elected President of the United States under current laws? Correct: 2. 2. For how many years is a United States Senator elected – that is, how many years are there in one **full** term of office for a U.S. Senator? Correct: 6. 3. How many U.S. Senators are there from each state? Correct 2. 4. For how many years is a member of the United States House of Representatives elected – that is, how many years are there in one **full** term of office for a U.S. House member? Correct: 2.	0	6

Table A1.10 (cont'd)

	5. According to federal law, if the President of the United States dies, is no longer willing or able to serve, or is removed from office by Congress, the Vice President would become the President. If the Vice President were unable or unwilling to serve, who would be eligible to become president next? (The Chief Justice of the Supreme Court, the Secretary of State, or the Speaker of the House of Representatives / The Speaker of the House of Representatives, the Secretary of States, or the Chief Justice of the Supreme Court)? Correct: The Speaker of the House of Representatives. 6. What percentage vote of the House and the Senate is needed to override a Presidential veto? (A bare majority, two-thirds, three-fourths, or ninety percent / Ninety percent, three-fourths, two-thirds, or a bare majority)? Correct: Two-thirds. Respondents were given one point for each correct answer, so the variable ranges from 0 to 6 (February 2008 wave).		
Interest in politics	How interested are you in information about what's going on in government and politics? (Extremely interested, very interested, moderately interested, slightly interested, or not interested at all)? 1=not interested at all; 2=slightly interested; 3=moderately interested; 4=very interested; 5=extremely interested.	1	5
Education	What is the highest degree or level of school you have completed? 1=no high school diploma; 2=high school diploma; 3=some college, no bachelor's degree; 4=bachelor's degree; 5=graduate degree (masters, professional, or doctoral degree) (January 2008 wave).	1	5
Biblical literalism	Which of these statements comes closest to describing your feelings about the Bible? 1= The Bible is the actual word of God and is to be taken literally; 2= The Bible is the word of God but not everything in it should be taken literally, word for word; 3 = The Bible is a book written by men and is not the word of God (February 2008 wave).	1	4
Female	Respondent sex. 1=female; 0=male (January 2008 wave).	0	1
Age – younger than 30	Self-identified age of respondent in years (January 2008 wave).	0	1
Age – 30 to 39	Self-identified age of respondent in years (January 2008 wave).	0	1
Age – 40 to 49	Self-identified age of respondent in years (January 2008 wave).	0	1

Table A1.10 (cont'd)

Age – 50 to 59	Self-identified age of respondent in years (January 2008 wave).	0	1
Age – 60 to 69	Self-identified age of respondent in years (January 2008 wave).	0	1
Age – 70 and older	Self-identified age of respondent in years (January 2008 wave).	0	1
American National Elections Study 2012			
Cause of climate change	[Do / Assuming it's happening, do] you think a rise in the world's temperatures would be caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes? 0=mostly by natural causes/about equally by human activity and natural causes; 1=mostly by human activity (Pre-election survey).	0	1
Political ideology	Where would you place YOURSELF on this scale, or haven't you thought much about this? 1=extremely liberal; 2=liberal 3=slightly liberal; 4=moderate, middle of the road; 5=slightly conservative; 6=conservative; 7=very conservative (Pre-election survey).	1	7
Political knowledge	Respondents were asked five questions about their knowledge of politics: 1. Do you happen to know how many times an individual can be elected President of the United States under current laws? 2. Is the U.S. federal budget deficit, the amount by which the government's spending exceeds the amount of money it collects, now bigger, about the same, or smaller than it was during most of the 1990s? 3. For how many years is a United States senator election, that is, how many years are there in one full term of office for a U.S. Senator? 4. What is Medicare? A program run by the U.S. federal government to pay for old people's health care; A program run by state governments to provide health care to poor people; A private health insurance plan sold to individuals in all 50 states; A private, non-profit organization that runs free health clinics. 5. On which of the following does the U.S. federal government currently spend the least? Foreign aid; Medicare; National Defense; Social Security	0	5

Table A.10 (cont'd)

	Respondents were given one point for each correct answer, so the variable ranges from 0 to 5 (Pre-election survey).		
Attention to politics	How often do you pay attention to what's going on in government and politics? (Always; most of the time; about half the time; some of the time; or Never)? 1=never; 2=some of the time; 3=about half the time; 4=most of the time; 5=always.	1	5
Education	What is the highest degree or level of school you have completed? 1=no high school diploma; 2=high school diploma; 3=some college, no bachelor's degree; 4=bachelor's degree; 5=graduate degree (masters, professional, or doctoral degree) (Pre-election survey).	1	5
Biblical literalism	Which of these statements comes closest to describing your feelings about the Bible? 1= The Bible is the actual word of God and is to be taken literally; 2= The Bible is the word of God but not everything in it should be taken literally, word for word; 3 = The Bible is a book written by men and is not the word of God (Pre-election survey).	1	3
Female	Respondent sex. 1=female; 0=male (Pre-election survey)	0	1
Age – younger than 30	Self-identified age of respondent in years (Pre-election survey).	0	1
Age – 30 to 39	Self-identified age of respondent in years (Pre-election survey).	0	1
Age – 40 to 49	Self-identified age of respondent in years (Pre-election survey).	0	1
Age – 50 to 59	Self-identified age of respondent in years (Pre-election survey).	0	1
Age – 60 to 69	Self-identified age of respondent in years (Pre-election survey).	0	1
Age – 70 and older	Self-identified age of respondent in years (Pre-election survey).	0	1
World Values Survey Variables			
Seriousness of climate change	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or greenhouse effect? 1=not serious at all; 2=not very serious; 3=somewhat serious; 4=very serious	1	4

Table A.10 (cont'd)

Seriousness of loss of species/biodiversity	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Loss of plant or animal species or biodiversity. 1=not serious at all; 2=not very serious; 3=somewhat serious; 4=very serious.	1	4
Seriousness of pollution of water	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Pollution of rivers, lakes and streams. 1=not serious at all; 2=not very serious; 3=somewhat serious; 4=very serious.	1	4
Post-materialism	12 item index: People sometimes talk about what the aims of this country should be for the next ten years. On his card are listed some of the goals which different people give top priority. Would you please say which one of these you, yourself consider the most important? And which would be the next most important? First list : a high level of economic growth; making sure this country has strong defense forces; seeing that people have more say about how things are done at their jobs and in their communities; trying to make our cities and countryside more beautiful. Second list: maintaining order in the nation; giving people more say in important government decisions; fighting rising prices; protecting freedom of speech Third list: a stable economy; progress toward a less impersonal and more humane society; progress toward a society in which ideas count more than money; the fight against crime	-2.5	2.5

Table A.10 (cont'd)

Political ideology	In political matters, people talk of "the left" and "the right". How would you place your views on this scale, generally speaking? 1=far left; 10=far right	1	10
Right	Self-positioning on the above left-right continuum: 7-10	0	1
Left	Self-positioning on the above left-right continuum: 1-4	0	1
Political interest	How interested would you say you are in politics? – -1.5=not at all interested, -0.5=not very interested, 0.5= somewhat interested, 1.5=very interested	-1.5	1.5
Education	What is the highest education level that you have attained? -3.5=no formal education -2.5=incomplete primary school -1.5=complete primary school -0.5=incomplete secondary school: technical/vocational type 0.5=complete secondary school: technical/vocational type 1.5=incomplete secondary: university-preparatory type 2.5=complete secondary: university-preparatory type 3.5=university-level education	-3.5	3.5
Religious attendance	Apart from weddings and funerals, about how often do you attend religious services these days? -3=never practically never; -2=less often; -1=once a year; 0=only on special holy days; 1=once a month; 2=once a week; 3=more than once a week	-3	3
Importance of God	"How important is God in your life? Please use this scale to indicate"… from "not at all important" to 'very important". -5=not at all important; 5=very important.	-5	5
Protestant	Do you belong to a religious denomination? 1=Protestant	0	1
Lower class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=lower class; 0=all other response categories.	0	1

Table A.10 (cont'd)

Working class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=working class; 0=all other response categories.	0	1
Middle class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=lower middle class; 0=all other response categories.	0	1
Upper class	People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the 1=upper middle class or upper class; 0=all other response categories.	0	1
Gender	Female=1	0	1
Age – younger than 30	Self-identified age of respondent in years.	0	1
Age – 30 to 39	Self-identified age of respondent in years.	0	1
Age – 40 to 49	Self-identified age of respondent in years.	0	1
Age – 50 to 59	Self-identified age of respondent in years.	0	1
Age – 60 to 69	Self-identified age of respondent in years.	0	1
Age – 70 and older	Self-identified age of respondent in years.	0	1
Country-level variable			
OECD country	Member of the Organization for Economic Cooperation and Development (OECD) or not.	0	1

Table A1.11: Chapter 6 – Survey questions, measurements, and variables

Variable Name	*Description/Question*	*Minimum Value*	*Maximum Variable*
Pew Global Attitudes Surveys (2009-2010)			
Willingness to pay to address climate change	Please tell me whether you agree or disagree with the following statement. "People should be willing to pay higher prices in order to address global climate change". 1=agree; 0=other response categories (disagree; don't know; refused	0	1
Seriousness of climate change (2009)	On another topic, in your view is global warming a very serious problem, somewhat serious, not too serious, or not a problem? 0=not a problem; 1=not too serious; 2=somewhat serious; 3=very serious.	0	3
Seriousness of climate change (2010)	On another topic, in your view global climate change a very serious problem, somewhat serious, not too serious, or not a problem? 0=not a problem; 1=not too serious; 2=somewhat serious; 3=very serious.	0	3
Age younger than 30	Self-identified age of respondent in years.	0	1
Age 40-49	Self-identified age of respondent in years.	0	1
Age 50-59	Self-identified age of respondent in years.	0	1
Age 60-69	Self-identified age of respondent in years.	0	1
Age 70 and older	Self-identified age of respondent in years.	0	1
Female	Respondent gender. 1=female; 0=male.	0	1
World Values Survey (2005-2009)			

Table A1.11 (cont'd)

Variable Name	*Description/Question*	*Minimum Value*	*Maximum Variable*
Seriousness of climate change	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Global warming or greenhouse effect. 0=not serious at all; 1=not very serious; 2=somewhat serious; 3=very serious.	1	4
Seriousness of loss of species/biodiversity	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Loss of plant or animal species or biodiversity. 0=not serious at all; 1=not very serious; 2=somewhat serious; 3=very serious.	1	4
Seriousness of pollution of water	Now let's consider environmental problems in the world as a whole. Please tell me how serious you consider each of the following. Is it very serious, somewhat serious, not very serious, or not serious at all? Pollution of rivers, lakes and streams. 0=not serious at all; 1=not very serious; 2=somewhat serious; 3=very serious.	1	4
International Social Survey Programme (2009-2010)			
Most/next most important issue – Environment	Which of these issues is the most important for [COUNTRY] today? Which is the next important? Health care; education; crime, the environment; immigration; the economy; terrorism; poverty; none of these; can't choose. 1= the environment was "the most important" OR "next most important" issue; 0 = all other responses	0	1

Table A1.11 (cont'd)

Most important environmental problem for country – climate change	"Here is a list of some different environmental problems. Which problem, in any do you think is the most important for [COUNTRY] as a whole? Air pollution; chemicals and pesticides; water shortage; water pollution; nuclear waste; domestic waste disposal; climate change; genetically modified foods; using up our natural resources; none of these; can't choose. 1=climate change; 0=other responses categories	0	1
Dangerousness of climate change	In general, do you think that a rise in the world's temperature caused by climate change is 0=not dangerous at all for the environment; 1=not very dangerous; 2=somewhat dangerous; 3=very dangerous; 4=extremely dangerous for the environment	0	4
Left party identification	Political partisanship. 1=far left (1) or left (2) political party; 0=all other categories.	0	1
Right party identification	Political partisanship. 1=right (4) or far right (5); 0=all other categories.	0	1
Level of education	Highest education attainment. -2=primary education or no formal education; -1 = intermediate secondary education; 0 =secondary education; 1=university incomplete; 2=university complete	-2	2
Female	Respondent sex. 1=female; 0=male.	0	1
Age – younger than 30	Self-identified age of respondent in years. 1=29 and younger; 0=all other ages.	0	1
Age – 30 to 39	Self-identified age of respondent in years. 1=30 to 39; 0=all other ages.	0	1
Age – 40 to 49	Self-identified age of respondent in years. 1=40 to 49; 0=all other ages.	0	1
Age – 50 to 59	Self-identified age of respondent in years. 1=50 to 59; 0=all other ages.	0	1
Age – 60 to 69	Self-identified age of respondent in years. 1=60 to 69; 0=all other ages.	0	1
Age – 70 and older	Self-identified age of respondent in years. 1=70 and older; 0=all other ages.	0	1

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Appendix B: Additional models, analysis and robustness checks for Chapter 4

Table A2.1: Random-intercept multilevel linear models with random country intercepts and polynomial terms for age predicting perceived seriousness of climate change (World Values Survey 2005-2009)

	(1)	(2)
Political ideology (from left to right)	**-0.0472**	**-0.0469**
	(0.0127)	(0.0127)
Post-materialism index	**0.0669**	**0.0665**
	(0.0220)	(0.0220)
Interest in politics	**0.0644**	**0.0635**
	(0.0201)	(0.0199)
Level of education	**0.0924**	**0.0919**
	(0.0140)	(0.0140)
Attendance of religious services	-0.0234	-0.0235
	(0.0144)	(0.0143)
Importance of God	**0.0452**	**0.0457**
	(0.0084)	(0.0083)
Protestant	**-0.1487**	-0.1441
	(0.0753)	(0.0747)
Female	**0.0709**	**0.0707**
	(0.0358)	(0.0358)
Age	0.0017	**0.0130**
	(0.0011)	(0.0048)
Age^2		**-0.0001**
		(0.0000)
Not serious at all | Not very serious	-4.2272	-4.0008
	(0.2364)	(0.2410)
Not very serious | Somewhat serious	-2.4523	-2.2259
	(0.1755)	(0.1739)
Somewhat serious | Very serious	-0.5084	-0.2816
	(0.1328)	(0.1503)
Variance component		
Country-level	**0.4095**	**0.4088**
	(0.1005)	(0.1001)
Number of respondents	39874	39874
Number of countries	41	41
AIC	71387	71377

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were all excluded from the models because relevant survey questions were not asked in these countries.

Table A2.2: Ordered logistic multilevel models with random country intercepts and polynomial terms for GDP per capita and HDI predicting perceived seriousness of climate change (World Values Survey 2005-2009)

	(1)	(2)
Political ideology	**-0.0473**	**-0.0471**
(from left to right)	(0.0126)	(0.0127)
Post-materialism index	**0.0659**	**0.0660**
	(0.0221)	(0.0221)
Interest in politics	**0.0631**	**0.0631**
	(0.0200)	(0.0201)
Education level	**0.0927**	**0.0927**
	(0.0140)	(0.0140)
Attendance of religious services	-0.0239	-0.0240
	(0.0142)	(0.0142)
Importance of God	**0.0460**	**0.0459**
	(0.0085)	(0.0085)
Protestant	-0.1432	-0.1402
	(0.0741)	(0.0741)
Female	0.0698	0.0698
	(0.0359)	(0.0359)
Age younger than 30	**-0.1178**	**-0.1174**
	(0.0464)	(0.0464)
Age 30-39	-0.0088	-0.0087
	(0.0324)	(0.0324)
Age 50-59	0.0189	0.0188
	(0.0331)	(0.0330)
Age 60-69	0.0126	0.0126
	(0.0465)	(0.0464)
Age 70 and older	-0.0517	-0.0518
	(0.0478)	(0.0478)
Country-level variables		
Natural logarithm of mean GDP per capita	-11.1538	
	(6.4951)	
Natural logarithm of mean GDP per capita^2	1.3911	
	(0.7745)	
Natural logarithm of mean GDP per capita^3	-0.0562	
	(0.0303)	
Mean HDI		**-89.4429**
		(19.5499)
Mean HDI^2		**148.0480**
		(32.4418)
Mean HDI^3		**-76.6277**
		(16.9083)
Not serious at all | Not very serious	-33.2017	-20.7863
	(17.8731)	(3.6108)
Not very serious| Somewhat serious	-31.4270	-19.0117
	(17.8465)	(3.5883)
Somewhat serious| Very serious	-29.4830	-17.0676
	(17.8536)	(3.6050)

Table A2.2 (cont'd)

Variance component		
Country-level	**0.3610**	**0.2760**
	(0.0832)	(0.0710)
Number of respondents	39973	39973
Number of countries	41	41
AIC	71555	71544

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were all excluded from the models because relevant survey questions were not asked in these countries.

Table A2.3: Random-intercept multilevel ordered logistic models with individual-level interactions predicting perceived seriousness of climate change (World Values Survey 2009-2011)

	(1)	(2)	(3)	(4)
Left	**0.0889**	**0.1089**		
(political ideology=1-4)	(0.0437)	(0.0434)		
Right	**-0.1951**	**-0.1983**		
(political ideology=7-10)	(0.0670)	(0.0674)		
Political ideology			**0.2596**	**0.2785**
(left=1; right=0)			(0.0725)	(0.0714)
Level of education	**0.0925**	**0.0922**	**0.0815**	**0.0929**
	(0.0159)	(0.0141)	(0.0185)	(0.0140)
Interest in politics	**0.0631**	0.0081	**0.0974**	0.0542
	(0.0194)	(0.0224)	(0.0239)	(0.0384)
Left X education	0.0165			
	(0.0143)			
Right X education	-0.0113			
	(0.0145)			
Left X interest in politics		**0.1495**		
		(0.0394)		
Right X interest in politics		0.0474		
		(0.0469)		
Political ideology X education			0.0284	
			(0.0184)	
Political ideology X interest in politics				0.1109
				(0.0617)
Post-materialism index	**0.0638**	**0.0630**	**0.0827**	**0.0818**
	(0.0219)	(0.0218)	(0.0271)	(0.0268)
Attendance of religious services	-0.0236	-0.0235	-0.0276	-0.0279
	(0.0141)	(0.0141)	(0.0146)	(0.0145)
Importance of God	**0.0465**	**0.0473**	**0.0428**	**0.0435**
	(0.0084)	(0.0084)	(0.0089)	(0.0089)
Protestant	-0.1443	**-0.1471**	-0.1271	-0.1293
	(0.0736)	(0.0732)	(0.0868)	(0.0871)
Female	0.0678	0.0670	**0.0857**	**0.0831**
	(0.0354)	(0.0356)	(0.0347)	(0.0349)
Age under 30	**-0.1190**	**-0.1171**	-0.0827	-0.0786
	(0.0457)	(0.0455)	(0.0500)	(0.0493)

Table A2.3 (cont'd)

Age 30-39	-0.0074	-0.0064	0.0390	0.0411
	(0.0319)	(0.0320)	(0.0418)	(0.0417)
Age 50-59	0.0184	0.0186	0.0785	0.0788
	(0.0335)	(0.0335)	(0.0421)	(0.0420)
Age 60-69	0.0140	0.0146	0.0889	0.0888
	(0.0463)	(0.0463)	(0.0528)	(0.0530)
Age 70 and older	-0.0505	-0.0495	-0.0475	-0.0458
	(0.0484)	(0.0476)	(0.0618)	(0.0612)
Not serious at all |	-4.1052	-4.0979	-3.7615	-3.7562
Not very serious	(0.1928)	(0.1902)	(0.2001)	(0.2016)
Not very serious |	-2.3305	-2.3231	-2.0499	-2.0442
Somewhat serious	(0.1464)	(0.1430)	(0.1563)	(0.1556)
Somewhat serious |	-0.3855	-0.3773	-0.1781	-0.1717
Very serious	(0.1121)	(0.1087)	(0.1225)	(0.1205)
Variance component				
Country-level standard deviation	**0.4056**	**0.4029**	**0.4033**	**0.4005**
	(0.0989)	(0.0981)	(0.0934)	(0.0925)
Number of respondents	39973	39973	24255	24255
Number of countries	41	41	41	41
AIC	71531	71509	43945	43936

Notes: Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were all excluded from the models because relevant survey questions were not asked in these countries.

Table A2.4: Random-intercept multilevel linear models without country-level predictors predicting perceived seriousness of climate change (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)	(5)	(6)
Political ideology (from left to right)	**-0.0060**	**-0.0057**			**-0.0057**	**-0.0059**
	(0.0017)	(0.0017)			(0.0017)	(0.0016)
Left (ideology=1-4)			0.0083			
			(0.0044)			
Right (ideology=7-10)			**-0.0298**			
			(0.0092)			
Social issues index				-0.0029	-0.0032	
				(0.0017)	(0.0017)	
Income equality				-0.0009	-0.0012	
				(0.0012)	(0.0011)	
Private Enterprise				0.0005	0.0012	
				(0.0012)	(0.0010)	
Post-materialism index	**0.0073**	**0.0065**	**0.0066**	**0.0065**	**0.0062**	**0.0067**
	(0.0026)	(0.0027)	(0.0026)	(0.0027)	(0.0029)	(0.0026)
Interest in politics	**0.0069**	**0.0073**	**0.0076**	**0.0039**	**0.0060**	**0.0071**
	(0.0024)	(0.0025)	(0.0023)	(0.0025)	(0.0027)	(0.0024)
Education level	**0.0093**	**0.0101**	**0.0096**	**0.0084**	**0.0086**	**0.0096**
	(0.0015)	(0.0015)	(0.0015)	(0.0017)	(0.0017)	(0.0015)
Attendance of religious services	-0.0018	-0.0022	-0.0022	-0.0017	-0.0017	-0.0022
	(0.0015)	(0.0016)	(0.0015)	(0.0015)	(0.0016)	(0.0015)
Importance of God	**0.0046**	**0.0047**	**0.0048**	**0.0044**	**0.0051**	**0.0048**
	(0.0010)	(0.0010)	(0.0009)	(0.0009)	(0.0011)	(0.0009)
Protestant	**-0.0212**	**-0.0225**	**-0.0215**	**-0.0174**	**-0.0203**	**-0.0215**
	(0.0082)	(0.0081)	(0.0072)	(0.0061)	(0.0073)	(0.0073)
Catholic	0.0004	0.0008				
	(0.0061)	(0.0062)				
Evangelical	0.0008	0.0005				
	(0.0045)	(0.0053)				
Muslim	0.0087	0.0075				
	(0.0107)	(0.0110)				
Lower class	0.0035					
	(0.0085)					
Working class	0.0042					
	(0.0040)					
Upper class	0.0025					
	(0.0044)					
Female	**0.0123**	**0.0095**	**0.0108**	**0.0107**	**0.0106**	**0.0110**
	(0.0043)	(0.0044)	(0.0044)	(0.0043)	(0.0043)	(0.0044)
Age younger than 30	**-0.0153**	**-0.0182**	**-0.0166**	**-0.0181**	**-0.0166**	**-0.0164**
	(0.0051)	(0.0054)	(0.0051)	(0.0053)	(0.0057)	(0.0051)
Age 30-39	-0.0034	-0.0038	-0.0027	-0.0046	-0.0048	-0.0028
	(0.0042)	(0.0045)	(0.0041)	(0.0046)	(0.0048)	(0.0041)
Age 50-59	-0.0010	0.0008	-0.0004	-0.0049	-0.0022	-0.0005
	(0.0044)	(0.0045)	(0.0043)	(0.0046)	(0.0047)	(0.0043)
Age 60-69	-0.0072	-0.0049	-0.0060	-0.0063	-0.0064	-0.0063
	(0.0063)	(0.0069)	(0.0062)	(0.0066)	(0.0072)	(0.0063)

Table A2.4 (cont'd)

Age 70 and older	-0.0095	-0.0069	-0.0086	-0.0107	-0.0092	-0.0088
	(0.0061)	(0.0068)	(0.0061)	(0.0067)	(0.0074)	(0.0061)
Self-described income decile		-0.0008				
		(0.0014)				
Constant	0.8544	0.8574	0.8320	0.8308	0.8600	0.8574
	(0.0143)	(0.0147)	(0.0124)	(0.0128)	(0.0138)	(0.0133)
Variance components						
Country-level standard deviation	**0.0695**	**0.0670**	**0.0686**	**0.0687**	**0.0703**	**0.0688**
	(0.0095)	(0.0096)	(0.0094)	(0.0087)	(0.0095)	(0.0094)
Individual-level standard deviation	**0.2250**	**0.2256**	**0.2251**	**0.2291**	**0.2259**	**0.2252**
	(0.0067)	(0.0064)	(0.0064)	(0.0072)	(0.0070)	(0.0065)
Number of respondents	38753	37189	39973	39068	32855	39973
Number of countries	40	39	41	40	39	41
AIC	-3765	-3430	-3872	-2935	-3100	-3840

Notes: Linear regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were all excluded from the models because relevant survey questions were not asked in these countries. The dependent variable, perceived seriousness of climate change, ranges from 0 to 1: 0 – not very serious; 0.33 – not very serious; 0.67 – somewhat serious; 1.0 – very serious.

Table A2.5: Random-intercept multilevel linear models with country-level predictors predicting perceived seriousness of climate change (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)
Political ideology	**-0.0059**	**-0.0059**	**-0.0059**	**-0.0059**
(from left to right)	(0.0016)	(0.0016)	(0.0016)	(0.0016)
Post-materialism index	**0.0067**	**0.0067**	**0.0067**	**0.0067**
	(0.0026)	(0.0026)	(0.0026)	(0.0026)
Interest in politics	**0.0071**	**0.0071**	**0.0071**	**0.0071**
	(0.0024)	(0.0024)	(0.0024)	(0.0024)
Level of education	**0.0095**	**0.0095**	**0.0095**	**0.0095**
	(0.0015)	(0.0015)	(0.0015)	(0.0015)
Attendance of religious services	-0.0022	-0.0022	-0.0022	-0.0022
	(0.0015)	(0.0015)	(0.0015)	(0.0015)
Importance of God	**0.0048**	**0.0048**	**0.0048**	**0.0048**
	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Protestant	**-0.0216**	**-0.0215**	**-0.0215**	**-0.0215**
	(0.0073)	(0.0073)	(0.0073)	(0.0073)
Female	**0.0109**	**0.0109**	**0.0109**	**0.0109**
	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Age younger than 30	**-0.0163**	**-0.0163**	**-0.0163**	**-0.0163**
	(0.0051)	(0.0051)	(0.0051)	(0.0051)
Age 30-39	-0.0027	-0.0027	-0.0027	-0.0027
	(0.0042)	(0.0042)	(0.0042)	(0.0042)
Age 50-59	-0.0005	-0.0005	-0.0005	-0.0005
	(0.0043)	(0.0043)	(0.0043)	(0.0043)
Age 60-69	-0.0064	-0.0064	-0.0064	-0.0064
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Age 70 and older	-0.0089	-0.0089	-0.0089	-0.0089
	(0.0061)	(0.0061)	(0.0061)	(0.0061)
Country-level variables				
Natural logarithm of mean GDP per capita	0.0094		0.0031	
	(0.0080)		(0.0115)	
Mean HDI		0.0934		0.0855
		(0.0835)		(0.1406)
Mean Polity score			0.0018	0.0015
			(0.0033)	(0.0032)
Mean Gini coefficient			0.0005	0.0007
			(0.0015)	(0.0013)
Natural logarithm of mean CO_2 emissions			0.0063	0.0009
(tons per capita)			(0.0136)	(0.0157)
Natural logarithm of oil and gas rents per capita			-0.0017	-0.0014
			(0.0028)	(0.0029)
Constant	0.7734	0.7884	0.7959	0.7627
	(0.0774)	(0.0685)	(0.1146)	(0.1064)
Variance Components				
Country-level standard deviation	0.0673	0.0670	0.0668	0.0666
	(0.0083)	(0.0081)	(0.0083)	(0.0083)
Individual-level standard deviation	0.2252	0.2252	0.2252	0.2252
	(0.0064)	(0.0065)	(0.0065)	(0.0065)

Table A2.5 (cont'd)

Number of respondents	39973	39973	39973	39973
Number of countries	41	41	41	41
AIC	-3840	-38340	-3832	-3832

Notes: Linear regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were all excluded from the models because relevant survey questions were not asked in these countries. The dependent variable, perceived seriousness of climate change, ranges from 0 to 1: 0 – not very serious; 0.33 – not very serious; 0.67 – somewhat serious; 1.0 – very serious.

Table A2.6: Random-intercept multilevel ordered logistic regression models without country-level predictors predicting perceived seriousness of climate change on multiple imputation datasets (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)	(5)	(6)
Political ideology	**-0.0468**	**-0.0459**			**-0.0503**	**-0.0467**
(from left to right)	(0.0098)	(0.0094)			(0.0094)	(0.0093)
Left			**0.0920**			
(ideology=1-4)			(0.0368)			
Right			**-0.0298**			
(ideology=7-10)			(0.0092)			
Social issues index				-0.0166	-0.0131	
				(0.0119)	(0.0012)	
Income equality				0.0223	0.0080	
				(0.0079)	(0.0078)	
Private Enterprise				0.008	0.0102	
				(0.0073)	(0.0074)	
Post-materialism index	**0.0646**	**0.0617**	**0.0610**	**0.0608**	**0.0537**	**0.0605**
	(0.0184)	(0.0189)	(0.0182)	(0.0184)	(0.0191)	(0.0182)
Interest in politics	**0.0588**	**0.0613**	**0.0606**	**0.0465**	**0.0573**	**0.0610**
	(0.0181)	(0.0182)	(0.0182)	(0.0192)	(0.0190)	(0.0176)
Education level	**0.0861**	**0.0944**	**0.0910**	**0.0862**	**0.0876**	**0.0909**
	(0.0114)	(0.0122)	(0.0123)	(0.0125)	(0.0128)	(0.0123)
Attendance of religious services	-0.0198	**-0.0231**	**-0.0239**	**-0.0307**	**-0.0279**	**-0.0240**
	(0.0111)	(0.0116)	(0.0109)	(0.0105)	(0.0109)	(0.0109)
Importance of God	**0.0489**	**0.0504**	**0.0485**	**0.0475**	**0.0527**	**0.0491**
	(0.0074)	(0.0076)	(0.0073)	(0.0070)	(0.0076)	(0.0074)
Protestant	**-0.1367**	**-0.1500**	**-0.1223**	**-0.01179**	**-0.1237**	**-0.1215**
	(0.0628)	(0.0646)	(0.0584)	(0.0602)	(0.0597)	(0.0589)
Catholic	-0.0399	-0.532				
	(0.0421)	(0.0446)				
Evangelical	-0.0475	-0.0457				
	(0.0342)	(0.0347)				
Muslim	0.0633					
	(0.0789)					
Lower class	0.0055					
	(0.0567)					
Working class	0.0236					
	(0.0319)					
Upper class	0.0385					
	(0.0444)					

Table A2.6 (cont'd)

Female	**0.0658**	**0.0724**	0.0593	**0.0695**	**0.0710**	0.0594
	(0.0311)	(0.0281)	(0.0307)	(0.0310)	(0.0311)	(0.0309)
Age younger than 30	**-0.0814**	**-0.0867**	**-0.0966**	**-0.1179**	**-0.0934**	**-0.0964**
	(0.0340)	(0.0360)	(0.0361)	(0.0602)	(0.0384)	(0.0364)
Age 30-39	-0.0116	-0.0088	-0.0109	-0.0959	-0.0118	-0.0116
	(0.0311)	(0.0036)	(0.0305)	(0.0380)	(0.0329)	(0.0306)
Age 50-59	0.0163	0.0180	0.0146	-0.0101	0.0134	0.0150
	(0.0337)	(0.0334)	(0.0334)	(0.0330)	(0.0339)	(0.331)
Age 60-69	0.0027	0.0094	0.0058	0.0209	0.0101	0.0052
	(0.0048)	(0.0485)	(0.0472)	(0.0491)	(0.0491)	(0.0471)
Age 70 and older	-0.0703	-0.0604	-0.0691	-0.0606	-0.0578	-0.0699
	(0.0427)	(0.0424)	(0.0419)	(0.0425)	(0.0425)	(0.0417)
Self-described income decile		0.0004				
		(0.0102)				
Not serious at all | Not very serious	-4.0074	-4.0093	-3.7913	-3.7605	-4.0373	-4.0201
	(0.1637)	(0.1713)	(0.1482)	(0.1566)	(0.1707)	(0.1602)
Not very serious | Somewhat serious	-2.3820	-2.3885	-2.1681	-2.1158	-2.4048	-2.3968
	(0.1357)	(0.1363)	(0.1273)	(0.1312)	(0.1390)	(0.1321)
Somewhat serious | Very serious	-0.5719	-0.5678	-0.3653	-0.3143	-0.5933	-0.5941
	(0.1073)	(0.0770)	(0.1008)	(0.1013)	(0.1109)	(0.1053)
Variance components						
Country-level variation	**0.3351**	**0.3160**	**0.3304**	**0.3371**	**0.3361**	**0.3308**
	(0.0781)	(0.0770)	(0.0771)	(0.0801)	(0.0821)	(0.0774)
Number of respondents	56842	56200	58402	55866	53851	58402
Number of countries	40	39	41	40	39	41

Notes: Five MI datasets were used, created by Amelia II. Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Four countries were excluded from Model 1 because survey questions were not asked in these countries. In China, the self-placement political ideology question was not asked. In Malaysia, the self-placement political ideology and religious attendance questions were not asked. Also, in Morocco, the religious attendance question was not asked. Finally, in Mexico, the question about socio-economic class was not asked. In Model 2, five countries were excluded: China, Malaysia, Morocco, Jordan, and Argentina. In Jordan and Argentina, the income decile question was not asked. In Model 3, China and Malaysia were both excluded because the self-placement political ideology question was not asked in either country. In Morocco, the religious attendance question was not asked. In Model 4, in addition to excluding to Morocco, Peru, Egypt and Malaysia are excluded because the social issues questions were not asked, so respondents from four countries were excluded. In Model 5, in addition to excluding Morocco, Peru, Egypt, and Malaysia, China was excluded because self-described political ideology was re-introduced into the model, so respondents from five countries were excluded. In Model 6, China, Malaysia, and Morocco were excluded.

Table A2.7: Random-intercept multilevel ordered logistic regression models with country-level predictors predicting perceived seriousness of climate change on multiple imputation datasets (World Values Survey 2005-2009)

	(1)	(2)	(3)	(4)
Political ideology	**-0.0467**	**-0.0467**	**-0.0467**	**-0.0467**
(from left to right)	(0.0093)	(0.0093)	(0.0093)	(0.0093)
Post-materialism index	**0.0603**	**0.0604**	**0.0603**	**0.0603**
	(0.0182)	(0.0182)	(0.0182)	(0.0182)
Interest in politics	**0.0611**	**0.0611**	**0.0611**	**0.0611**
	(0.0176)	(0.0176)	(0.0177)	(0.0177)
Education level	**0.0907**	**0.0907**	**0.0907**	**0.0907**
	(0.0123)	(0.0140)	(0.0123)	(0.0123)
Attendance of religious services	**-0.0238**	-0.0238	**-0.0238**	**-0.0238**
	(0.0109)	(0.0109)	(0.0109)	(0.0109)
Importance of God	**0.0492**	**0.0492**	**0.0491**	**0.0491**
	(0.0074)	(0.0074)	(0.0074)	(0.0074)
Protestant	**-0.1218**	**-0.1216**	**-0.1220**	**-0.1217**
	(0.0589)	(0.0589)	(0.0587)	(0.0588)
Female	0.0592	0.0593	0.0593	0.0593
	(0.0309)	(0.0309)	(0.0309)	(0.0309)
Age under 30	**-0.0958**	**-0.0959**	**-0.0959**	**-0.0959**
	(0.0364)	(0.0364)	(0.0364)	(0.0364)
Age 30-39	-0.0114	-0.0114	-0.0114	-0.0114
	(0.0306)	(0.0306)	(0.0306)	(0.0306)
Age 50-59	0.0143	0.0143	0.0143	0.0143
	(0.0331)	(0.0331)	(0.0330)	(0.0330)
Age 60-69	0.0046	0.0046	0.0047	0.0047
	(0.0471)	(0.0470)	(0.0471)	(0.0470)
Age 70 and older	-0.0707	-0.0707	-0.0706	-0.0706
	(0.0565)	(0.0416)	(0.0417)	(0.0417)
Country-level variables				
Natural logarithm of mean GDP per capita	0.0608		0.0859	
	(0.0565)		(0.0979)	
Mean HDI		0.4805		0.6453
		(0.5901)		(1.1687)
Mean polity score			0.0009	0.0055
			(0.0246)	(0.0236)
Mean GINI coefficient			0.0062	0.0061
			(0.0116)	(0.0105)
Natural logarithm of CO_2 emissions per capita			-0.00116	-0.0111
			(0.1114)	(0.1345)
Natural logarithm of oil and gas rents per capita			-0.0020	-0.0025
			(0.0267)	(0.0280)
Not serious at all| Not very serious	-3.486	-3.6731	-3.0523	-3.3117
	(0.5411)	(0.4826)	(0.9008)	(0.8751)
Not very serious| Somewhat serious	-1.8627	-2.0500	-1.4290	-1.6884
	(0.5517)	(0.4988)	(0.8946)	(0.8678)
Somewhat serious| Very serious	-0.0600	-0.2471	0.3737	0.1143
	(0.5312)	(0.4707)	(0.8867)	(0.8579)
Variance component				
Country-level variance	**0.3217**	**0.3236**	**0.3193**	**0.3209**
	(0.00732)	(0.0744)	(0.0728)	(0.0738)

Table A2.7 (cont'd)

Number of respondents	58402	58402	58402	58402
Number of countries	41	41	41	41
AIC	71555	71555	71563	71563

Notes: Five MI datasets were used, created by Amelia II. Cell entries are ordered logistic regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. China, Malaysia, and Morocco were excluded due to missing variables at the individual level.

Table A2.8: Random-intercept multilevel linear models predicting perceived dangerousness of climate change (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Left party identification	**0.0127**	**0.0112**	**0.0129**	**0.0128**	**0.0128**	**0.0127**
	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)
Right party identification	**-0.0264**	**-0.0250**	**-0.0356**	**-0.0356**	**-0.0356**	**-0.0357**
	(0.0086)	(0.0089)	(0.0093)	(0.0093)	(0.0093)	(0.0093)
Level of education	**0.0083**	**0.0063**	**0.0068**	**0.0068**	**0.0068**	**0.0068**
	(0.0026)	(0.0024)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Self-described	**0.0214**	**0.0224**	**0.0215**	**0.0215**	**0.0215**	**0.0215**
environmental knowledge	(0.0027)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Income gap	**-0.0197**	**-0.0190**				
	(0.0024)	(0.0025)				
Private enterprise	**-0.0072**	**-0.0070**				
	(0.0023)	(0.0024)				
Post-materialism index	0.0015	0.0013	-0.0053	-0.0053	-0.0054	-0.0054
	(0.0027)	(0.0029)	(0.0030)	(0.0030)	(0.0030)	(0.0030)
Attendance of religious services	0.0019	0.0013	0.0014	0.0014	0.0014	0.0014
	(0.0010)	(0.0011)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Catholic	0.0002	0.0004				
	(0.0074)	(0.0077)				
Protestant	-0.0060	-0.0018	-0.0070	-0.0072	-0.0072	-0.0074
	(0.0109)	(0.0122)	(0.0100)	(0.0099)	(0.0099)	(0.0098)
Muslim	0.0230	0.0177				
	(0.0189)	(0.0204)				
Female	**0.0282**	**0.0254**	**0.0300**	**0.0300**	**0.0300**	**0.0300**
	(0.0052)	(0.0053)	(0.0054)	(0.0054)	(0.0054)	(0.0054)
Age younger than 30	-0.0050	-0.0059	-0.0033	-0.0033	-0.0034	-0.0034
	(0.0065)	(0.0069)	(0.0066)	(0.0066)	(0.0066)	(0.0066)
Age 30-39	0.0085	0.0065	0.0104	0.0104	0.0104	0.0104
	(0.0056)	(0.0060)	(0.0055)	(0.0055)	(0.0055)	(0.0055)
Age 50-59	**-0.0160**	**-0.0176**	**-0.0132**	**-0.0132**	**-0.0132**	**-0.0132**
	(0.0045)	(0.0047)	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Age 60-69	**-0.0228**	**-0.0219**	**-0.0201**	**-0.0200**	**-0.0200**	**-0.0200**
	(0.0049)	(0.0055)	(0.0048)	(0.0048)	(0.0048)	(0.0048)
Age 70 and older	**-0.0320**	**-0.0300**	**-0.0278**	**-0.0278**	**-0.0278**	**-0.0278**
	(0.0062)	(0.0066)	(0.0064)	(0.0064)	(0.0064)	(0.0064)
Self-described income decile		0.0004				
		(0.0019)				
Country-level						
Natural logarithm of mean GDP			**-0.0323**		**-0.0375**	
per capita			(0.0101)		(0.0142)	

Table A2.8 (cont'd)

Mean HDI				**-0.3748**		-0.3241
				(0.1234)		(0.2706)
Mean polity score					0.0183	0.0129
					(0.0123)	(0.0128)
Mean GINI coefficient					0.0024	0.0025
					(0.0020)	(0.0023)
Natural logarithm of mean CO_2					0.0118	0.0064
emissions per capita (in tons)					(0.0186)	(0.0247)
Natural logarithm of oil and gas					0.0003	-0.0003
rents per capita					(0.0043)	(0.0046)
Constant	0.6745	0.6787	1.0079	1.0053	0.7880	0.7496
	(0.0138)	(0.0199)	(0.1036)	(0.1071)	(0.1595)	(0.2060)
Variance components						
Country level standard deviation	**0.0657**	**0.0657**	**0.0595**	**0.0602**	**0.0558**	**0.0575**
	(0.0083)	(0.0089)	(0.0088)	(0.0087)	(0.0066)	(0.0071)
Individual-level standard deviation	**0.2322**	**0.2312**	**0.2328**	**0.2328**	**0.2328**	**0.2328**
	(0.0044)	(0.0046)	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Number of respondents	28017	26257	29526	29526	29526	29526
Number of countries	29	27	29	29	29	29
AIC	-1506	-1546	-1498	-1497	-1492	-1491

Notes: Cell entries linear regression coefficients with the standard errors in parentheses, clustered by country in parentheses. The dependent variable is perceived dangerousness of climate change, ranging from 0 to 1. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion of missing values. In Model 1, Israel, Taiwan, and Turkey were all excluded from the model because relevant survey questions were not asked in these countries. In Taiwan and Israel, respondents were not asked about their political party identification. In Turkey, respondents were not asked to self-evaluate their knowledge of the causes and solutions of environmental problems. In Model 2, in addition to excluding Israel, Taiwan, and Turkey, New Zealand and Great Britain were excluded, as respondents were not asked about their income. For Models 3-6, Israel, Taiwan, and Turkey were excluded.

Table A2.9: Random-intercept multilevel linear models with polynomial terms for age predicting perceived dangerousness of climate change (International Social Survey Programme 2009-2011)

	(1)	(2)
Left party identification	**0.0130**	**0.0127**
	(0.0047)	(0.0047)
Right party identification	**-0.0261**	**-0.0263**
	(0.0085)	(0.0085)
Level of education	**0.0091**	**0.0086**
	(0.0026)	(0.0026)
Self-described environmental knowledge	**0.0212**	**0.0212**
	(0.0026)	(0.0026)
Income gap	**-0.0196**	**-0.0196**
	(0.0024)	(0.0024)
Private enterprise	**-0.0073**	**-0.0072**
	(0.0023)	(0.0023)
Post-materialism index	0.0013	0.0013
	(0.0027)	(0.0027)
Attendance of religious services	0.0018	0.0019
	(0.0010)	(0.0010)
Catholic	0.0006	0.0005
	(0.0074)	(0.0073)
Protestant	-0.0061	-0.0060
	(0.0108)	(0.0109)
Muslim	0.0243	0.0236
	(0.0189)	(0.0188)
Female	**0.0284**	**0.0284**
	(0.0052)	(0.0052)
Age	**-0.0006**	0.0008
	(0.0002)	(0.0006)
Age^2		**-0.00001**
		(0.000005)
Constant	0.6919	0.6641
	(0.0126)	(0.0171)
Variance components		
Country-level standard deviation	**0.0659**	**0.0659**
	(0.0083)	(0.0083)
Individual-level standard deviation	**0.2324**	**0.2323**
	(0.0044)	(0.0044)
Number of individuals	28017	28017
Number of countries	29	29
AIC	-1492	-1497

Notes: Cell entries are linear regression coefficients with the standard errors in parentheses, clustered by country in parentheses. The dependent variable is perceived dangerousness of climate change, ranging from 0 to 1. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion used for missing values. Israel, Taiwan, and Turkey were all excluded from the models because relevant survey questions were not asked in these countries.

Table A2.10: Random-intercept multilevel linear models with individual-level interactions predicting perceived dangerousness of climate change (International Social Science Programme 2009-2011)

	(1)	(2)	(3)	(4)
Left party identification	**0.0128**	**0.0130**		
	(0.0049)	(0.0046)		
Right party identification	**-0.0350**	**-0.0351**		
	(0.0093)	(0.0092)		
Party			**0.0482**	**0.0482**
(left=1; right=0)			(0.0092)	(0.0089)
Level of education	0.0044	**0.0068**	0.0044	**0.0090**
	(0.0029)	(0.0025)	(0.0046)	(0.0027)
Self-described environmental knowledge	**0.0215**	**0.0198**	**0.0222**	0.0097
	(0.0028)	(0.0034)	(0.0037)	(0.0058)
Left party identification X Education	**0.0072**			
	(0.0032)			
Right party identification X Education	-0.0010			
	(0.0051)			
Left party identification X Environmental		0.0096		
Knowledge		(0.0055)		
Right party identification X Environmental		-0.0095		
Knowledge		(0.0065)		
Party X Education			0.0072	
			(0.0045)	
Party X Environmental Knowledge				**0.0185**
				(0.0075)
Post-materialism index	-0.0054	-0.0054	-0.0062	-0.0063
	(0.0030)	(0.0030)	(0.0034)	(0.0034)
Attendance of religious service	0.0014	0.0014	0.0030	0.0030
	(0.0011)	(0.0011)	(0.0017)	(0.0017)
Catholic	0.0016	0.0018	0.0000	0.0005
	(0.0074)	(0.0074)	(0.0088)	(0.0088)
Protestant	-0.0063	-0.0061	-0.0103	-0.0100
	(0.0113)	(0.0111)	(0.0128)	(0.0127)
Muslim	0.0181	0.0189	-0.0108	-0.0098
	(0.0175)	(0.0172)	(0.0274)	(0.0267)
Female	**0.0300**	**0.0300**	**0.0323**	**0.0322**
	(0.0054)	(0.0054)	(0.0058)	(0.0057)
Age younger than 30	-0.0033	-0.0034	0.0054	0.0053
	(0.0065)	(0.0065)	(0.0073)	(0.0073)
Age 30-39	0.0104	0.0103	0.0136	0.0132
	(0.0055)	(0.0055)	(0.0074)	(0.0073)
Age 50-59	**-0.0128**	**-0.0130**	**-0.0170**	**-0.0171**
	(0.0044)	(0.0044)	(0.0063)	(0.0062)
Age 60-69	**-0.0196**	**-0.0197**	**-0.0217**	**-0.0217**
	(0.0047)	(0.0048)	(0.0059)	(0.0059)
Age 70 and older	**-0.0274**	**-0.0277**	**-0.0288**	**-0.0291**
	(0.0064)	(0.0064)	(0.0080)	(0.0080)

Table A2.10 (cont'd)

Variance components				
Country-level	**0.0663**	**0.0661**	**0.0689**	**0.0687**
	(0.008)	(0.008)	(0.0088)	(0.0088)
Individual-level	**0.2327**	**0.2327**	**0.2341**	**0.2340**
	(0.0044)	(0.0044)	(0.0042)	(0.0042)
Number of respondents	29526	29526	16220	16220
Number of countries	29	29	29	29
AIC	-1497	-1502	-626	-635

Notes: Cell entries linear regression coefficients with the standard errors in parentheses, clustered by country in parentheses. The dependent variable is perceived dangerousness of climate change, ranging from 0 to 1. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion used for missing values. Israel, Taiwan, and Turkey were all excluded from the models because relevant survey questions were not asked in these countries.

Table A2.11: Random-intercept multilevel linear models predicting perceived dangerousness of climate change on multiple-imputation datasets (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Left party identification	**0.0146**	**0.0132**	**0.0148**	**0.0147**	**0.0147**	**0.0147**
	(0.0495)	(0.0052)	(0.0050)	(0.0050)	(0.0050)	(0.0050)
Right party identification	**-0.0339**	**-0.0317**	**-0.0336**	**-0.0336**	**-0.0336**	**-0.0336**
	(0.0084)	(0.0094)	(0.0084)	(0.0084)	(0.0084)	(0.0084)
Level of education	**0.0081**	**0.0061**	**0.0080**	**0.0081**	**0.0080**	**0.0081**
	(0.0024)	(0.0022)	(0.0024)	(0.0024)	(0.0024)	(0.0024)
Environmental knowledge	**0.0206**	**0.0210**	**0.0206**	**0.0206**	**0.0206**	**0.0206**
	(0.0027)	(0.0028)	(0.0027)	(0.0027)	(0.0027)	(0.0027)
Income gap	**-0.0198**	**-0.0191**	**-0.0197**	**-0.0197**	**-0.0198**	**-0.0198**
	(0.0026)	(0.0028)	(0.0026)	(0.0026)	(0.0026)	(0.0026)
Private enterprise	**-0.0105**	**-0.0102**	**-0.0105**	**-0.0105**	**-0.0105**	**-0.0105**
	(0.0029)	(0.0031)	(0.0029)	(0.0029)	(0.0029)	(0.0029)
Post-materialism index	0.0019	0.0014	0.0019	0.0019	0.0019	0.0019
	(0.0024)	(0.0025)	(0.0024)	(0.0024)	(0.0025)	(0.0025)
Attendance of religious services	0.0011	0.0007	0.0011	0.0011	0.0011	0.0011
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Catholic	0.0011	0.0006	0.0010	0.0010	0.0010	0.0010
	(0.0064)	(0.0068)	(0.0063)	(0.0064)	(0.0064)	(0.0064)
Protestant	-0.0056	-0.0025	-0.0053	-0.0054	-0.0054	-0.0055
	(0.0081)	(0.0091)	(0.0080)	(0.0080)	(0.0080)	(0.0080)
Muslim	0.0153	0.0093	0.0152	0.0152	0.0152	0.0153
	(0.0164)	(0.0165)	(0.0165)	(0.0165)	(0.0165)	(0.0165)
Self-described income decile		0.0008				
		(0.0016)				
Female	**0.0319**	**0.0300**	**0.0320**	**0.0320**	**0.0320**	**0.0320**
	(0.0048)	(0.0049)	(0.0048)	(0.0048)	(0.0048)	(0.0048)
Age younger than 30	-0.0067	-0.0068	-0.0067	-0.0067	-0.0067	-0.0067
	(0.0061)	(0.0064)	(0.0061)	(0.0061)	(0.0061)	(0.0061)
Age 30-39	0.0067	0.0050	0.0067	0.0067	0.0067	0.0067
	(0.0051)	(0.0054)	(0.0051)	(0.0051)	(0.0051)	(0.0051)
Age 50-59	**-0.0164**	**-0.0163**	**-0.0164**	**-0.0164**	**-0.0164**	**-0.0164**
	(0.0059)	(0.0061)	(0.0059)	(0.0059)	(0.0059)	(0.0059)
Age 60-69	**-0.0280**	**-0.0275**	**-0.0280**	**-0.0280**	**-0.0279**	**-0.0279**
	(0.0058)	(0.0063)	(0.0058)	(0.0058)	(0.0058)	(0.0058)
Age 70 and older	**-0.0364**	**-0.0335**	**-0.0364**	**-0.0363**	**-0.0363**	**-0.0363**
	(0.0071)	(0.0065)	(0.0071)	(0.0071)	(0.0071)	(0.0071)
Country-level						
Natural logarithm of mean GDP per capita			**-0.0342**		**-0.0348**	
			(0.0098)		(0.0149)	
Mean HDI				**-0.4000**		-0.2998
				(0.1202)		(0.2699)
Mean polity score					0.0155	0.0105
					(0.0128)	(0.0130)
Mean GINI coefficient					0.0024	0.0025
					(0.0019)	(0.0024)
Natural logarithm of mean CO_2 emissions per capita (in tons)					0.0054	0.0004
					(0.0183)	(0.0231)

Table A2.11 (cont'd)

Natural logarithm of oil and gas rents per capita					-0.0002 (0.0043)	-0.0008 (0.0045)
Constant	0.6719 (0.0135)	0.6731 (0.0174)	1.0098 (0.0996)	1.0097 (0.1037)	0.7861 (0.1572)	0.7493 (0.2136)
Variance components						
Country-level	**0.0666** (0.0080)	**0.0677** (0.0086)	**0.0589** (0.0086)	**0.0597** (0.0086)	**0.0559** (0.0066)	**0.0575** (0.0071)
Individual-level	**0.2356** (0.0043)	**0.2343** (0.0044)	**0.2356** (0.0043)	**0.2356** (0.0043)	**0.2356** (0.0043)	**0.2356** (0.0043)
Number of respondents	40109	38009	40109	40109	40109	40109
Number of countries	29	27	29	29	29	29

Notes: Five MI datasets were used, created by Amelia II. *Notes*: Cell entries are linear regression coefficients with the standard errors in parentheses, clustered by country in parentheses. The dependent variable is perceived dangerousness of climate change, ranging from 0 to 1. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Israel, Taiwan, and Turkey were all excluded from the models because relevant survey questions were not asked in these countries.

Appendix C: Additional models, analysis and robustness checks for Chapter 5

Table A3.1: Random-intercept, random-coefficient multilevel linear models predicting concern about environmental issues (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Left party identification	**0.0207**	**0.0165**	-0.0343	-0.0045	0.0165	0.0112
	(0.0058)	(0.0058)	(0.0586)	(0.0594)	(0.0121)	(0.0066)
Right party identification	**-0.0189**	-0.0148	**0.3297**	**0.2890**	0.0139	**-0.0292**
	(0.0089)	(0.0098)	(0.0761)	(0.0995)	(0.0212)	(0.0092)
Level of education	**0.0080**	**0.0078**	**0.0077**	**0.0078**	**0.0078**	**0.0078**
	(0.0018)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
Environmental knowledge	**0.0906**	**0.0903**	**0.0903**	**0.0903**	**0.0903**	**0.0903**
	(0.0068)	(0.0068)	(0.0067)	(0.0067)	(0.0068)	(0.0067)
Post-materialism index	**0.0119**	**0.0114**	**0.0114**	**0.0114**	**0.0114**	**0.0113**
	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0038)
Attendance of religious services	**0.0035**	**0.0034**	**0.0034**	**0.0035**	**0.0035**	**0.0034**
	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)
Protestant	-0.0010	-0.0001	-0.0001	-0.0002	-0.0001	-0.0004
	(0.0091)	(0.0089)	(0.0089)	(0.0089)	(0.0089)	(0.0089)
Female	**0.0454**	**0.0447**	**0.0448**	**0.0448**	**0.0447**	**0.0447**
	(0.0041)	(0.0040)	(0.0040)	(0.0041)	(0.0040)	(0.0040)
Age younger than 30	**-0.0306**	**-0.0307**	**-0.0306**	**-0.0306**	**-0.0307**	**-0.0307**
	(0.0063)	(0.0063)	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Age 30-39	**-0.0133**	**-0.0130**	**-0.0129**	**-0.0129**	**-0.0130**	**-0.0130**
	(0.0050)	(0.0050)	(0.0050)	(0.0050)	(0.0050)	(0.0051)
Age 50-59	**0.0118**	**0.0116**	**0.0115**	**0.0116**	**0.0116**	**0.0116**
	(0.0050)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)
Age 60-69	0.0074	0.0073	0.0074	0.0073	0.0073	0.0074
	(0.0069)	(0.0069)	(0.0068)	(0.0069)	(0.0068)	(0.0068)
Age 70 and older	0.0066	0.0069	0.0072	0.0071	0.0070	0.0070
	(0.0098)	(0.0097)	(0.0098)	(0.0098)	(0.0098)	(0.0097)
Country-level variables						
Natural logarithm of GDP per capita			0.0022			
			(0.0136)			
HDI				0.1543		
				(0.1905)		
OECD country					0.0333	
					(0.0310)	
Post-communist country						**-0.0725**
						(0.0315)
Cross-level interaction terms						
Left X Natural log of GDP per capita			0.0050			
			(0.0058)			
Right X Natural log of GDP per capita			**-0.0342**			
			(0.0075)			
Left X HDI				0.0240		
				(0.0694)		
Right X HDI				**-0.3544**		
				(0.1140)		

Table A3.1 (cont'd)

Left X OECD country					-0.0006	
					(0.0139)	
Right X OECD country					-0.0393	
					(0.0235)	
Left X post-communist country						0.0150
						(0.0126)
Right X post-communist country						**0.0498**
						(0.0219)
Constant	0.6506	0.6530	0.6309	0.5224	0.6308	0.6763
	(0.0156)	(0.0158)	(0.1329)	(0.1572)	(0.0220)	(0.0166)
Variance components						
Country-level standard deviation	**0.0717**	**0.0788**	**0.0787**	**0.0780**	**0.0772**	**0.0709**
	(0.0082)	(0.0105)	(0.0105)	(0.0107)	(0.0118)	(0.0088)
Individual-level standard deviation	**0.2480**	**0.2474**	**0.2474**	**0.2474**	**0.2474**	**0.2474**
	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)
Left party identification standard deviation		**0.0222**	**0.0229**	**0.0228**	**0.0227**	**0.0208**
		(0.0046)	(0.0045)	(0.0044)	(0.0045)	(0.0044)
Right-party identification standard deviation		**0.0419**	**0.0313**	**0.0342**	**0.0389**	**0.0353**
		(0.0071)	(0.0081)	(0.0073)	(0.0077)	(0.0088)
Number of respondents	30471	30471	30471	30471	30471	30471
Number of countries	29	29	29	29	29	29
AIC	1189	1144	1138	1142	1146	1142

Notes: Data is weighted. Cell entries are linear regression coefficients with standard error clustered by country in parentheses with list wise deletion. **Bold** indicates two-tailed $p<0.05$. Israel, Taiwan, and Turkey not included because of omitted questions in these countries.

Table A3.2: Random-intercept, random-coefficient multilevel linear models predicting perceived dangerousness of climate change (International Social Survey Programme 2009-2011)

	(1)	(2)	(3)	(4)	(5)	(6)
Left party identification	**0.0127**	**0.0111**	-0.0490	-0.0334	0.0093	**0.0161**
	(0.0047)	(0.0046)	(0.0645)	(0.0585)	(0.0078)	(0.0055)
Right party identification	**-0.0359**	**-0.0319**	0.0806	0.1096	-0.0196	**-0.0416**
	(0.0094)	(0.0098)	(0.1203)	(0.1310)	(0.0195)	(0.0109)
Level of education	**0.0068**	**0.0068**	**0.0067**	**0.0067**	**0.0067**	**0.0067**
	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Environmental knowledge	**0.0215**	**0.0214**	**0.0214**	**0.0214**	**0.0214**	**0.0214**
	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Post-materialism index	-0.0054	-0.0055	-0.0055	-0.0055	-0.0055	-0.0056
	(0.0030)	(0.0030)	(0.0031)	(0.0030)	(0.0030)	(0.0030)
Attendance of religious services	0.0015	0.0014	0.0013	0.0013	0.0014	0.0014
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Protestant	-0.0074	-0.0049	-0.0047	-0.0048	-0.0049	-0.0055
	(0.0100)	(0.0095)	(0.0094)	(0.0094)	(0.0094)	(0.0094)
Female	**0.0300**	**0.0297**	**0.0297**	**0.0297**	**0.0297**	**0.0297**
	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)
Age younger than 30	-0.0033	-0.0043	-0.0044	-0.0044	-0.0043	-0.0043
	(0.0066)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)
Age 30-39	0.0104	0.0099	0.0099	0.0099	0.0099	0.0101
	(0.0055)	(0.0056)	(0.0056)	(0.0056)	(0.0056)	(0.0056)
Age 50-59	**-0.0132**	**-0.0136**	**-0.0136**	**-0.0136**	**-0.0136**	**-0.0136**
	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)
Age 60-69	**-0.0201**	**-0.0199**	**-0.0199**	**-0.0199**	**-0.0199**	**-0.0196**
	(0.0048)	(0.0048)	(0.0048)	(0.0048)	(0.0048)	(0.0048)
Age 70 and older	**-0.0278**	**-0.0279**	**-0.0278**	**-0.0278**	**-0.0279**	**-0.0273**
	(0.0064)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)
Country-level						
Natural logarithm of mean GDP per capita			**-0.0325**			
			(0.0106)			
Mean HDI				**-0.3707**		
				(0.1323)		
OECD country					-0.0050	
					(0.0269)	
Post-communist country						-0.0125
						(0.0253)
Cross-level interaction terms						
Left X natural logarithm of mean GDP per capita			0.0061			
			(0.0065)			
Right X natural logarithm of mean GDP per capita			-0.0112			
			(0.0119)			
Left X mean HDI				0.0528		
				(0.0691)		
Right X mean HDI				-0.1655		
				(0.1516)		
Left X OECD country					0.0026	
					(0.0099)	
Right X OECD country					-0.0168	
					(0.0228)	

Table A3.2 (cont'd)

Left X Post-communist country						**-0.0191**
						(0.0085)
Right X Post-communist country						0.0410
						(0.0210)
Constant	**0.6881**	**0.6889**	**1.0108**	**1.0024**	**0.6922**	**0.6927**
	(0.0139)	(0.0142)	(0.1084)	(0.1139)	(0.0232)	(0.0178)
Variance components						
Country-level standard deviation	**0.0662**	**0.065**	**0.0581**	**0.0591**	**0.0650**	**0.0650**
	(0.0080)	(0.0082)	(0.0081)	(0.0081)	(0.0083)	(0.0080)
Individual-level standard deviation	**0.2328**	**0.2322**	**0.2322**	**0.2322**	**0.2322**	**0.02322**
	(0.0044)	(0.0044)	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Left party identification standard deviation		**0.0135**	**0.0123**	**0.0131**	**0.0135**	**0.0095**
		(0.004)	(0.0044)	(0.0040)	(0.0039)	(0.0058)
Right party identification standard deviation		**0.0445**	**0.0427**	**0.0424**	**0.0434**	**0.0409**
		(0.0065)	(0.006)	(0.006)	(0.0066)	(0.0072)
Number of respondents	29526	29526	29526	29526	29526	29526
Number of countries	29	29	29	29	29	29
AIC	-1495	-1552	-1551	-1550	-1546	-1558

***Notes*:** Data are weighted. Cell entries are linear regression coefficients with standard error clustered by country in parentheses with list wise deletion. **Bold** indicates two-tailed p<0.05. Israel, Taiwan, and Turkey not included because of omitted questions in these countries.

Appendix D: Additional models, analysis and robustness checks for Chapter 6

Table A4.1: Ordered logistic regression models predicting perceived seriousness of environmental problems in the United States (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.4226**	**-0.2128**	**-0.2513**
	(0.0543)	(0.0575)	(0.0475)
Post-materialism index	0.0914	0.0842	**0.2048**
	(0.0531)	(0.0629)	(0.0574)
Interest in politics	-0.0630	**0.1971**	0.0283
	(0.0894)	(0.0928)	(0.0854)
Level of education	0.0275	-0.0409	-0.0031
	(0.0583)	(0.0649)	(0.0581)
Attendance of religious services	**-0.1114**	-0.0442	**-0.1628**
	(0.0401)	(0.0426)	(0.0420)
Importance of God	**0.1230**	**0.1178**	**0.1438**
	(0.0330)	(0.0337)	(0.0333)
Protestant	-0.2440	-0.1101	-0.1078
	(0.1598)	(0.1695)	(0.1594)
Female	0.2785	**0.3983**	**0.4595**
	(0.1424)	(0.1543)	(0.1426)
Age younger than 30	-0.0740	-0.1483	-0.2895
	(0.2418)	(0.2481)	(0.2425)
Age 30-39	-0.0562	0.1253	-0.1839
	(0.2171)	(0.2479)	(0.2219)
Age 50-59	0.0327	-0.0333	-0.3521
	(0.2217)	(0.2242)	(0.2226)
Age 60-69	0.1159	-0.1047	-0.4117
	(0.2752)	(0.2824)	(0.2772)
Age 70 and older	0.1839	0.0488	-0.3496
	(0.2748)	(0.2623)	(0.2588)
Not serious at all| Not very serious	-5.0108	-5.6436	-4.6128
	(0.4409)	(0.4789)	(0.4122)
Not very serious | Somewhat serious	-3.5811	-3.6840	-2.9518
	(0.4199)	(0.4095)	(0.3595)
Somewhat serious | Very serious	-1.8762	-1.5047	-0.9767
	(0.3950)	(0.3968)	(0.3448)
Number of respondents	1154	1149	1152
AIC	2504	1860	2436

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.2: Ordered logistic regression models predicting perceived seriousness of environmental problems in Australia (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.1042**	-0.0397	-0.0306
	(0.0363)	(0.0401)	(0.0351)
Post-materialism index	0.0893	0.1162	**0.2134**
	(0.0530)	(0.0633)	(0.0506)
Interest in politics	0.0994	0.1206	0.0798
	(0.0753)	(0.0890)	(0.0762)
Level of education	-0.0153	0.0233	-0.0128
	(0.0390)	(0.0437)	(0.0379)
Attendance of religious services	-0.0599	-0.0912	**-0.0845**
	(0.0403)	(0.0467)	(0.0383)
Importance of God	0.0300	0.0096	-0.0131
	(0.0243)	(0.0284)	(0.0235)
Protestant	-0.0544	-0.0351	-0.0140
	(0.1406)	(0.1641)	(0.1401)
Female	**0.4566**	**0.4157**	**0.3660**
	(0.1261)	(0.1550)	(0.1271)
Age younger than 30	-0.0469	-0.1465	0.1968
	(0.2190)	(0.2850)	(0.2266)
Age 30-39	0.0804	-0.2918	0.2753
	(0.2147)	(0.2646)	(0.2115)
Age 50-59	0.2020	0.0524	0.1929
	(0.1979)	(0.2465)	(0.1860)
Age 60-69	-0.2279	-0.2422	0.0120
	(0.2012)	(0.2421)	(0.1951)
Age 70 and older	-0.3801	-0.3800	-0.3521
	(0.2290)	(0.2658)	(0.2221)
Not serious at all| Not very serious	-4.7491	-6.9913	-5.4040
	(0.3503)	(1.0411)	(0.5128)
Not very serious | Somewhat serious	-3.0182	-4.2585	-2.5804
	(0.2927)	(0.3787)	(0.2786)
Somewhat serious | Very serious	-0.9110	-1.4016	-0.3428
	(0.2726)	(0.3217)	(0.2676)
Number of respondents	1245	1246	1245
AIC	2118	1382	2105

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.3: Ordered logistic regression models predicting perceived seriousness of environmental problems in Canada (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.1309**	**-0.1155**	**-0.1288**
	(0.0459)	(0.0511)	(0.0375)
Post-materialism index	0.0630	0.1073	0.1135
	(0.0622)	(0.0651)	(0.0621)
Interest in politics	0.1053	-0.0139	0.0398
	(0.0805)	(0.0889)	(0.0724)
Level of education	-0.0411	-0.0429	0.0208
	(0.0459)	(0.0571)	(0.0461)
Attendance of religious services	-0.0565	-0.0522	-0.0461
	(0.0415)	(0.0570)	(0.0444)
Importance of God	0.0364	0.0680	0.0470
	(0.0294)	(0.0370)	(0.0300)
Protestant	-0.1609	0.0371	-0.1063
	(0.1967)	(0.2325)	(0.1919)
Female	0.2389	0.1583	0.1759
	(0.1426)	(0.1737)	(0.1414)
Age younger than 30	-0.1157	0.0056	0.3442
	(0.2133)	(0.2560)	(0.2075)
Age 30-39	-0.1037	-0.0210	0.0512
	(0.2363)	(0.2715)	(0.2286)
Age 50-59	0.0217	-0.0293	0.1409
	(0.2108)	(0.2516)	(0.2140)
Age 60-69	-0.2650	-0.2883	-0.3138
	(0.2411)	(0.3063)	(0.2533)
Age 70 and older	-0.2166	0.2283	-0.2132
	(0.2698)	(0.3258)	(0.2607)
Not serious at all| Not very serious	-5.1451	-5.6962	-5.2302
	(0.4122)	(0.6182)	(0.4713)
Not very serious | Somewhat serious	-3.5111	-4.5698	-3.1161
	(0.3577)	(0.4346)	(0.3000)
Somewhat serious | Very serious	-1.3911	-1.8953	-1.0434
	(0.3262)	(0.3855)	(0.2808)
Number of respondents	1526	1554	1538
AIC	2641	1892	2761

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.4: Ordered logistic regression models predicting perceived seriousness of environmental problems in Chile (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	0.0225	0.0086	-0.0310
	(0.0536)	(0.0597)	(0.0563)
Post-materialism index	0.1548	0.0423	0.0942
	(0.0881)	(0.0931)	(0.0820)
Interest in politics	0.1407	0.1115	0.1958
	(0.1331)	(0.1466)	(0.1267)
Level of education	**0.2128**	0.1830*	0.0816
	(0.0686)	(0.0751)	(0.0602)
Attendance of religious services	-0.0287	-0.0939	**-0.1334**
	(0.0639)	(0.0728)	(0.0626)
Importance of God	**0.1293**	**0.2411**	0.2076*
	(0.0526)	(0.0526)	(0.0536)
Protestant	-0.0737	-0.4428	-0.3558
	(0.3227)	(0.3545)	(0.3403)
Female	0.2182	0.2225	0.4788
	(0.2402)	(0.2822)	(0.2498)
Age younger than 30	-0.5585	-0.4992	-0.2242
	(0.3481)	(0.3971)	(0.3315)
Age 30-39	-0.1334	-0.1415	0.0255
	(0.3370)	(0.3654)	(0.3368)
Age 50-59	-0.5047	-0.1146	-0.6291
	(0.3444)	(0.4416)	(0.3672)
Age 60-69	0.3523	0.0884	0.6034
	(0.4809)	(0.4682)	(0.5848)
Age 70 and older	0.0136	-0.1022	-0.1135
	(0.4655)	(0.5399)	(0.4925)
Not serious at all| Not very serious	-4.4610		
	(0.5898)		
Not very serious | Somewhat serious	-3.0441	-3.2502	-3.0174
	(0.4387)	(0.5719)	(0.4515)
Somewhat serious | Very serious	-0.6554	-0.8130	-0.7260
	(0.4088)	(0.4815)	(0.4277)
Number of respondents	625	635	632
AIC	861	686	769

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.5: Ordered logistic regression models predicting perceived seriousness of environmental problems in Italy (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0776	-0.0214	-0.0770
	(0.0440)	(0.0493)	(0.0407)
Post-materialism index	-0.0033	**0.2298**	0.0108
	(0.0749)	(0.0827)	(0.0673)
Interest in politics	-0.0079	0.0055	0.0750
	(0.1172)	(0.1281)	(0.1029)
Level of education	-0.0387	-0.0095	-0.0266
	(0.0563)	(0.0600)	(0.0512)
Attendance of religious services	**-0.1619**	**-0.2323**	**-0.1826**
	(0.0753)	(0.0770)	(0.0625)
Importance of God	**0.1277**	**0.1692**	**0.1315**
	(0.0514)	(0.0527)	(0.0465)
Protestant	--	--	--
Female	0.2605	0.3347	0.1105
	(0.1891)	(0.2075)	(0.1710)
Age younger than 30	-0.5040	-0.6202	-0.4326
	(0.3043)	(0.3433)	(0.2614)
Age 30-39	-0.2377	-0.3035	0.0954
	(0.2932)	(0.3428)	(0.2588)
Age 50-59	-0.0597	-0.2358	-0.4000
	(0.3209)	(0.3692)	(0.2736)
Age 60-69	**-0.6860**	**-0.7442**	**-0.7536**
	(0.3150)	(0.3462)	(0.2793)
Age 70 and older	-0.6323	-0.7071	-0.8440
	(0.4301)	(0.4427)	(0.4365)
Not serious at all| Not very serious	-5.2388	-6.7767	-5.4926
	(0.4824)	(1.0768)	(0.5339)
Not very serious | Somewhat serious	-3.4798	-4.9723*	-3.3383
	(0.3715)	(0.5475)	(0.3346)
Somewhat serious | Very serious	-1.4445	-1.5183	-0.9603
	(0.3491)	(0.3921)	(0.3048)
Number of respondents	674	681	674
AIC	1004	743	1148

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?” There were no Protestants in the sample in Italy, so this variable was not included in the model.

Table A4.6: Ordered logistic regression models predicting perceived seriousness of environmental problems in Spain (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.2294**	**-0.2640**	**-0.2216**
	(0.0415)	(0.0453)	(0.0431)
Post-materialism index	**-0.1852**	**-0.1630**	**-0.2518**
	(0.0613)	(0.0647)	(0.0620)
Interest in politics	**-0.2502**	**-0.3077**	**-0.3000**
	(0.0909)	(0.1076)	(0.0961)
Level of education	**0.1039**	0.0346	0.0582
	(0.0455)	(0.0469)	(0.0439)
Attendance of religious services	-0.0164	-0.0082	-0.0764
	(0.0528)	(0.0628)	(0.0577)
Importance of God	0.0482	0.0457	0.0641
	(0.0313)	(0.0371)	(0.0340)
Protestant	**12.9063**	**11.5962**	**14.0554**
	(0.5531)	(0.5943)	(0.5675)
Female	0.0554	0.0217	0.1504
	(0.1606)	(0.1820)	(0.1621)
Age younger than 30	0.0793	0.2067	0.2039
	(0.2603)	(0.2959)	(0.2650)
Age 30-39	-0.0257	-0.0791	0.0446
	(0.2550)	(0.2808)	(0.2556)
Age 50-59	-0.2414	-0.2442	-0.0668
	(0.2635)	(0.3029)	(0.2744)
Age 60-69	0.3689	0.1055	0.2907
	(0.3091)	(0.3290)	(0.3001)
Age 70 and older	-0.4583	-0.3458	-0.3521
	(0.2798)	(0.3359)	(0.2851)
Not serious at all| Not very serious	-8.0807	-8.2705	-7.6428
	(1.0217)	(1.0509)	(1.0695)
Not very serious | Somewhat serious	-4.6708	-5.0685	-4.3043
	(0.3675)	(0.3992)	(0.3743)
Somewhat serious | Very serious	-2.0774	-2.7065	-1.8880
	(0.3154)	(0.3601)	(0.3340)
Number of respondents	952	954	954
AIC	1211	1017	1199

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.7: Ordered logistic regression models predicting perceived seriousness of environmental problems in Switzerland (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology	**-0.2014**	**-0.1518**	**-0.0879**
(from left to right)	(0.0404)	(0.0422)	(0.0363)
Post-materialism index	0.0857	0.1147	**0.1431**
	(0.0602)	(0.0639)	(0.0587)
Interest in politics	0.0658	0.0795	-0.0758
	(0.0928)	(0.0932)	(0.0845)
Level of education	0.0566	-0.0315	**-0.1274**
	(0.0438)	(0.0462)	(0.0421)
Attendance of religious services	-0.0484	-0.0630	0.0067
	(0.0468)	(0.0467)	(0.0424)
Importance of God	0.0542	0.0089	-0.0153
	(0.0288)	(0.0284)	(0.0266)
Protestant	-0.2553	-0.0421	-0.1623
	(0.1429)	(0.1527)	(0.1416)
Female	**0.4629**	0.1634	**0.4032**
	(0.1404)	(0.1500)	(0.1388)
Age younger than 30	0.2591	0.2075	0.4911
	(0.2996)	(0.3209)	(0.3199)
Age 30-39	**0.4852**	0.0590	0.0528
	(0.2361)	(0.2419)	(0.2014)
Age 50-59	-0.1564	0.2492	0.1478
	(0.1999)	(0.2301)	(0.2151)
Age 60-69	0.1581	-0.2035	0.0214
	(0.2142)	(0.2190)	(0.1993)
Age 70 and older	-0.1249	0.1289	**0.4880**
	(0.2355)	(0.2465)	(0.2451)
Not serious at all| Not very serious	-4.7302	-7.9762	-4.8752
	(0.3895)	(1.0611)	(0.4176)
Not very serious | Somewhat serious	-2.6874	-3.8949	-2.4483
	(0.3118)	(0.3485)	(0.2954)
Somewhat serious | Very serious	-0.5347	-1.1549	-0.0037
	(0.2974)	(0.3214)	(0.2854)
Number of respondents	1015	1016	1016
AIC	2079	1626	2097

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.8: Ordered logistic regression models predicting perceived seriousness of environmental problems in South Korea (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology	**-0.1035***	-0.0375	-0.0003
(from left to right)	(0.0430)	(0.0435)	(0.0393)
Post-materialism index	0.0192	0.0568	-0.0171
	(0.0845)	(0.0801)	(0.0785)
Interest in politics	0.1162	-0.0021	0.0449
	(0.1083)	(0.1128)	(0.1059)
Level of education	0.0464	0.0664	**0.2228**
	(0.0607)	(0.0682)	(0.0612)
Attendance of religious services	-0.0025	0.0467	-0.0341
	(0.0470)	(0.0466)	(0.0498)
Importance of God	0.0011	0.0120	0.0549
	(0.0375)	(0.0379)	(0.0373)
Protestant	-0.0713	-0.3167	-0.2279
	(0.2262)	(0.2141)	(0.1998)
Female	-0.0225	0.0588	0.0368
	(0.1522)	(0.1511)	(0.1609)
Age younger than 30	0.0357	-0.0560	-0.2608
	(0.2139)	(0.2203)	(0.2255)
Age 30-39	0.1133	0.0942	-0.2131
	(0.2199)	(0.2266)	(0.2132)
Age 50-59	0.2268	0.1844	0.0576
	(0.2660)	(0.2577)	(0.2813)
Age 60-69	**-0.7963**	-0.0997	-0.4882
	(0.2968)	(0.2964)	(0.3098)
Age 70 and older	-1.0156	0.3094	0.8924
	(0.7308)	(0.6311)	(0.6288)
Not serious at all| Not very serious		-7.5663	-6.7865
		(1.0668)	(0.7992)
Not very serious | Somewhat serious	-3.8637	-3.2948	-2.7183
	(0.3985)	(0.4276)	(0.3930)
Somewhat serious | Very serious	-0.6216	0.0893	0.7251
	(0.3581)	(0.3779)	(0.3796)
Number of respondents	1187	1187	1187
AIC	1957	2014	2013

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.9: Ordered logistic regression models predicting perceived seriousness of environmental problems in Norway (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0935**	**-0.0886**	**-0.1010**
	(0.0355)	(0.0419)	(0.0375)
Post-materialism index	**0.3507**	**0.2002**	**0.3681**
	(0.0703)	(0.0692)	(0.0695)
Interest in politics	0.0474	0.1212	0.0811
	(0.1007)	(0.1043)	(0.1051)
Level of education	**0.1300**	**0.0861**	0.0038
	(0.0400)	(0.0437)	(0.0424)
Attendance of religious services	0.0522	-0.0596	-0.0002
	(0.0521)	(0.0561)	(0.0540)
Importance of God	0.0238	**0.0729**	0.0327
	(0.0293)	(0.0313)	(0.0307)
Protestant	**-0.3185**	**-0.4286**	**-0.5913**
	(0.1467)	(0.1619)	(0.1549)
Female	0.2668	**0.3591**	0.2259
	(0.1363)	(0.1510)	(0.1400)
Age younger than 30	-0.2417	0.0127	0.2186
	(0.2147)	(0.2311)	(0.2217)
Age 30-39	-0.3578	-0.0819	-0.1336
	(0.2052)	(0.2227)	(0.2108)
Age 50-59	-0.2140	0.3836	-0.1548
	(0.2208)	(0.2513)	(0.2103)
Age 60-69	-0.2985	0.2011	-0.0649
	(0.2312)	(0.2438)	(0.2310)
Age 70 and older	0.1679	**0.9416**	0.3399
	(0.2841)	(0.3544)	(0.3178)
Not serious at all| Not very serious	-4.8097	-5.8127	-6.1624
	(0.4120)	(0.6087)	(0.5449)
Not very serious | Somewhat serious	-3.1522	-3.7963	-3.7534
	(0.3293)	(0.3850)	(0.3541)
Somewhat serious | Very serious	-0.9235	-1.1508	-1.2976
	(0.3131)	(0.3471)	(0.3253)
Number of respondents	966	969	969
AIC	1717	1341	1564

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.10: Ordered logistic regression models predicting perceived seriousness of environmental problems in Finland (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0821**	**-0.0948**	**-0.0720**
	(0.0370)	(0.0386)	(0.0364)
Post-materialism index	0.0963	0.0029	0.0013
	(0.0656)	(0.0657)	(0.0640)
Interest in politics	0.0578	**0.1991**	0.0656
	(0.0927)	(0.0930)	(0.0881)
Level of education	**0.0964**	0.0416	0.0221
	(0.0387)	(0.0404)	(0.0392)
Attendance of religious services	0.0042	-0.0372	0.0642
	(0.0521)	(0.0563)	(0.0524)
Importance of God	0.0032	0.0481	-0.0011
	(0.0304)	(0.0298)	(0.0286)
Protestant	--	--	--
Female	**0.4748**	**0.6508**	**0.5071**
	(0.1433)	(0.1533)	(0.1425)
Age younger than 30	-0.1147	**-0.5244**	-0.0248
	(0.2296)	(0.2510)	(0.2214)
Age 30-39	0.0406	-0.3623	-0.2701
	(0.2134)	(0.2410)	(0.2152)
Age 50-59	-0.0052	**-0.5397**	-0.3333
	(0.2202)	(0.2457)	(0.2267)
Age 60-69	0.0769	**-0.5522**	-0.3385
	(0.2506)	(0.2773)	(0.2467)
Age 70 and older	0.1404	-0.5337	-0.0896
	(0.2548)	(0.2909)	(0.2765)
Not serious at all| Not very serious	-5.2717	-6.1876	-4.7104
	(0.5007)	(0.5917)	(0.3959)
Not very serious | Somewhat serious	-2.4810	-3.9280	-2.2844
	(0.2890)	(0.3561)	(0.2888)
Somewhat serious | Very serious	-0.1747	-1.0424	0.0948
	(0.2782)	(0.2979)	(0.2767)
Number of respondents	847	853	847
AIC	1609	1340	1748

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?" There were no Protestants in the sample in Finland, so this variable was not included in the model.

Table A4.11: Ordered logistic regression models predicting perceived seriousness of environmental problems in Germany (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0854** (0.0332)	**-0.1018** (0.0315)	**-0.1155** (0.0305)
Post-materialism index	0.0861 (0.0541)	0.0602 (0.0500)	**0.1245** (0.0487)
Interest in politics	0.0964 (0.0730)	**0.2710** (0.0791)	0.1063 (0.0652)
Level of education	**0.0853** (0.0325)	0.0433 (0.0337)	**0.0737** (0.0279)
Attendance of religious services	-0.0115 (0.0463)	**-0.1400** (0.0478)	-0.0792 (0.0418)
Importance of God	0.0287 (0.0256)	0.0661* (0.0265)	0.0257 (0.0231)
Protestant	--	--	--
Female	**0.3060** (0.1124)	**0.4967** (0.1134)	**0.3994** (0.1093)
Age younger than 30	-0.1810 (0.1908)	0.1070 (0.1935)	-0.0541 (0.1798)
Age 30-39	-0.0395 (0.1807)	-0.0964 (0.1794)	-0.1562 (0.1836)
Age 50-59	0.0298 (0.1954)	-0.1761 (0.2045)	-0.1434 (0.1749)
Age 60-69	0.0892 (0.1801)	0.0206 (0.1778)	-0.0659 (0.1688)
Age 70 and older	0.0332 (0.1932)	-0.3311 (0.1750)	-0.1267 (0.1825)
Not serious at all| Not very serious	-5.4579 (0.3885)	-4.9766 (0.3914)	-4.9608 (0.3141)
Not very serious | Somewhat serious	-2.5777 (0.2591)	-1.9760 (0.2399)	-1.8627 (0.2138)
Somewhat serious | Very serious	-0.2010 (0.2385)	0.1624 (0.2256)	0.2573 (0.2088)
Number of respondents	1648	1664	1656
AIC	3093	3348	3478

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?” Germany were not asked about their religious identity, so the Protestant variable was not included in the model.

Table A4.12: Ordered logistic regression models predicting perceived seriousness of environmental problems in Sweden (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.1030**	**-0.0912**	**-0.1327**
	(0.0367)	(0.0405)	(0.0354)
Post-materialism index	0.0556	0.1009	0.0070
	(0.0694)	(0.0713)	(0.0675)
Interest in politics	0.0857	0.1591	0.1341
	(0.0959)	(0.1100)	(0.0976)
Level of education	0.0612	0.0319	-0.0825
	(0.0463)	(0.0504)	(0.0486)
Attendance of religious services	-0.0284	-0.0898	-0.1082
	(0.0640)	(0.0666)	(0.0635)
Importance of God	0.0211	-0.0065	0.0138
	(0.0302)	(0.0308)	(0.0285)
Protestant	-2.0272	-1.1979	-0.4769
	(1.5016)	(2.3774)	(2.0109)
Female	**0.5473**	**0.8949**	**0.5475**
	(0.1578)	(0.1649)	(0.1460)
Age younger than 30	-0.3975	-0.3517	0.1156
	(0.2438)	(0.2585)	(0.2282)
Age 30-39	-0.0428	-0.3259	-0.1109
	(0.2539)	(0.2632)	(0.2356)
Age 50-59	-0.0493	0.2488	0.1205
	(0.2447)	(0.2714)	(0.2209)
Age 60-69	-0.4463	-0.3830	-0.2274
	(0.2605)	(0.2756)	(0.2453)
Age 70 and older	0.0983	0.1850	-0.2113
	(0.3115)	(0.3303)	(0.3064)
Not serious at all| Not very serious	-6.1300	-6.8355	-5.9905
	(0.6541)	(1.0764)	(0.5837)
Not very serious | Somewhat serious	-3.2982	-3.9998	-3.1033
	(0.3595)	(0.4175)	(0.3241)
Somewhat serious | Very serious	-0.8670	-0.9926	-0.9135
	(0.3290)	(0.3440)	(0.3014)
Number of respondents	915	925	923
AIC	1473	1164	1600

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.13: Ordered logistic regression models predicting perceived seriousness of environmental problems in Japan (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.1003**	-0.0244	**-0.1074**
	(0.0499)	(0.0468)	(0.0472)
Post-materialism index	0.1049	0.1074	**0.1908**
	(0.0793)	(0.0710)	(0.0695)
Interest in politics	0.2197	0.1787	0.1959
	(0.1324)	(0.1202)	(0.1238)
Level of education	0.0573	0.0018	0.0503
	(0.0648)	(0.0575)	(0.0597)
Attendance of religious services	0.0013	0.0794	0.0069
	(0.0797)	(0.0701)	(0.0681)
Importance of God	**0.0733**	0.0574	0.0554
	(0.0363)	(0.0333)	(0.0321)
Protestant	-0.4212	-0.6279	0.7375
	(0.9223)	(0.7843)	(0.8892)
Female	0.5198*	**0.4471**	**0.4008**
	(0.1791)	(0.1611)	(0.1655)
Age younger than 30	-0.1482	0.1900	0.3891
	(0.2974)	(0.2676)	(0.2611)
Age 30-39	0.3368	0.1285	0.2176
	(0.3246)	(0.2799)	(0.2484)
Age 50-59	-0.3107	0.0421	-0.0647
	(0.2662)	(0.2498)	(0.2223)
Age 60-69	-0.2094	-0.1385	-0.2470
	(0.3002)	(0.2622)	(0.2395)
Age 70 and older	-0.4064	-0.4166	0.2709
	(0.3443)	(0.3140)	(0.3189)
Not serious at all| Not very serious			-6.1560
			(0.8327)
Not very serious | Somewhat serious	-4.3250	-3.5287	-2.8565
	(0.4809)	(0.4026)	(0.3629)
Somewhat serious | Very serious	-1.2697	-0.3105	-0.1601
	(0.3929)	(0.3527)	(0.3515)
Number of respondents	673	671	667
AIC	901	1067	1223

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.14: Ordered logistic regression models predicting perceived seriousness of environmental problems in Mexico (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology	-0.0274	-0.0194	-0.0202
(from left to right)	(0.0229)	(0.0286)	(0.0251)
Post-materialism index	**-0.1346**	-0.0244	-0.0779
	(0.0593)	(0.0749)	(0.0629)
Interest in politics	0.1313	0.2370*	0.0616
	(0.0670)	(0.0859)	(0.0735)
Level of education	**0.2307**	**0.2764**	**0.2247**
	(0.0344)	(0.0450)	(0.0395)
Attendance of religious services	**-0.1115**	-0.0465	-0.0653
	(0.0376)	(0.0494)	(0.0436)
Importance of God	0.0561	**0.1224**	**0.1095**
	(0.0477)	(0.0546)	(0.0461)
Protestant	1.2042	**14.3232**	1.5021
	(0.8065)	(0.3402)	(1.0492)
Female	-0.1446	-0.0815	-0.1087
	(0.1307)	(0.1740)	(0.1455)
Age younger than 30	**-0.6431**	-0.3083	-0.2380
	(0.1941)	(0.2809)	(0.2185)
Age 30-39	0.1572	-0.4564	0.1274
	(0.2115)	(0.2778)	(0.2344)
Age 50-59	0.1717	-0.0139	0.1212
	(0.2507)	(0.3342)	(0.2721)
Age 60-69	0.4956	0.1158	0.5704
	(0.3088)	(0.3722)	(0.3409)
Age 70 and older	0.1945	0.9930	0.0552
	(0.3532)	(0.6168)	(0.4113)
Not serious at all| Not very serious	-4.2540	-4.3838	-3.7757
	(0.3851)	(0.4722)	(0.3699)
Not very serious | Somewhat serious	-2.5331	-3.2447	-2.5007
	(0.3125)	(0.4193)	(0.3283)
Somewhat serious | Very serious	-0.9491	-1.6601	-1.0032
	(0.2962)	(0.3817)	(0.3059)
Number of respondents	1220	1240	1240
AIC	1994	1259	1658

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.15: Ordered logistic regression models predicting perceived seriousness of environmental problems in Slovenia (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0499	-0.0469	-0.0697
	(0.0428)	(0.0441)	(0.0424)
Post-materialism index	0.1026	-0.0999	-0.0876
	(0.0866)	(0.0884)	(0.0858)
Interest in politics	**0.2572**	0.1297	0.1476
	(0.1095)	(0.1146)	(0.1058)
Level of education	-0.0928	-0.0203	-0.0689
	(0.0525)	(0.0536)	(0.0511)
Attendance of religious services	-0.0472	-0.0742	-0.0377
	(0.0590)	(0.0585)	(0.0540)
Importance of God	0.0411	0.0348	0.0259
	(0.0351)	(0.0347)	(0.0332)
Protestant	-0.7881	-0.5693	0.0160
	(0.8189)	(0.7679)	(0.7381)
Female	-0.0709	0.1339	0.2106
	(0.1733)	(0.1800)	(0.1664)
Age younger than 30	0.0638	0.2365	0.1667
	(0.2630)	(0.2836)	(0.2600)
Age 30-39	-0.3373	0.0299	-0.1309
	(0.2727)	(0.2867)	(0.2735)
Age 50-59	0.1219	0.1617	0.0631
	(0.2787)	(0.2881)	(0.2666)
Age 60-69	0.0718	0.1400	0.0965
	(0.3168)	(0.3103)	(0.3232)
Age 70 and older	-0.1644	-0.1624	-0.3134
	(0.3338)	(0.3610)	(0.3217)
Not serious at all| Not very serious	-5.4597	-5.0939	-4.7657
	(0.5819)	(0.5569)	(0.4746)
Not very serious | Somewhat serious	-3.1351	-3.7516	-3.1075
	(0.3451)	(0.4071)	(0.3763)
Somewhat serious | Very serious	-0.9333	-0.8306	-0.5702
	(0.3246)	(0.3390)	(0.3273)
Number of respondents	571	589	585
AIC	1000	887	1063

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.16: Ordered logistic regression models predicting perceived seriousness of environmental problems in Turkey (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.1548**	-0.0598	-0.0656
	(0.0473)	(0.0395)	(0.0355)
Post-materialism index	**-0.2126**	**-0.3392**	**-0.1883**
	(0.0787)	(0.0724)	(0.0671)
Interest in politics	-0.0244	0.0611	0.0337
	(0.1018)	(0.0926)	(0.0912)
Level of education	**0.1205**	**0.1541**	**0.0943**
	(0.0506)	(0.0484)	(0.0417)
Attendance of religious services	0.0654	0.0576	0.0722
	(0.0556)	(0.0546)	(0.0501)
Importance of God	0.0754	-0.0198	0.0069
	(0.0654)	(0.0603)	(0.0595)
Protestant	--	--	--
Female	0.1735	-0.0732	-0.2684
	(0.2413)	(0.2282)	(0.2108)
Age younger than 30	**-0.5749**	-0.2592	-0.4243
	(0.2835)	(0.2736)	(0.2361)
Age 30-39	-0.3466	-0.0029	-0.2845
	(0.3326)	(0.3172)	(0.2755)
Age 50-59	-0.4500	0.3092	-0.3558
	(0.3632)	(0.3800)	(0.3254)
Age 60-69	0.2059	-0.8371	-0.6155
	(0.6036)	(0.4390)	(0.4746)
Age 70 and older	0.0618	0.2590	-0.3133
	(0.6864)	(0.7149)	(0.5335)
Not serious at all| Not very serious	-6.0114	-5.9415	-5.2802
	(0.5188)	(0.6917)	(0.4851)
Not very serious | Somewhat serious	-4.3253	-4.4315	-3.9957
	(0.4214)	(0.4284)	(0.3775)
Somewhat serious | Very serious	-2.9067	-2.3967	-2.2397
	(0.4065)	(0.3837)	(0.3490)
Number of respondents	1028	1044	1038
AIC	931	959	1251

Ordered logistic coefficient. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?” There were no Protestants in the sample in Turkey, so this variable was not included in the model.

Table A4.17: Ordered logistic regression models predicting perceived seriousness of environmental problems in Poland (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0107	-0.0178	-0.0121
	(0.0386)	(0.0443)	(0.0409)
Post-materialism index	-0.0092	0.0851	0.0181
	(0.0900)	(0.0984)	(0.0909)
Interest in politics	0.0465	0.3320*	0.1514
	(0.1063)	(0.1161)	(0.1074)
Level of education	-0.0303	-0.0488	-0.0662
	(0.0513)	(0.0574)	(0.0516)
Attendance of religious services	-0.0258	-0.0756	-0.0529
	(0.0678)	(0.0754)	(0.0735)
Importance of God	**0.1048**	**0.1096**	**0.1487**
	(0.0490)	(0.0496)	(0.0544)
Protestant	0.8636	**14.9454**	0.3045
	(1.1710)	(0.5856)	(1.0543)
Female	**-0.3500**	-0.0817	0.0599
	(0.1663)	(0.1904)	(0.1694)
Age younger than 30	0.3730	0.2453	0.1709
	(0.2513)	(0.2629)	(0.2506)
Age 30-39	0.5541	**0.7450**	0.4485
	(0.2830)	(0.3276)	(0.2968)
Age 50-59	0.2800	0.3581	0.3616
	(0.2418)	(0.2615)	(0.2440)
Age 60-69	0.5392	0.4462	0.3400
	(0.3120)	(0.3565)	(0.3066)
Age 70 and older	0.1271	0.1344	0.0946
	(0.3316)	(0.3681)	(0.3323)
Not serious at all| Not very serious	-4.3125	-4.9057	-4.4129
	(0.5575)	(0.6533)	(0.5972)
Not very serious | Somewhat serious	-2.5205	-3.5058	-2.4066
	(0.3520)	(0.4225)	(0.3589)
Somewhat serious | Very serious	0.1022	-0.6645	0.1159
	(0.3084)	(0.3272)	(0.3163)
Number of respondents	671	675	674
AIC	1177	920	1147

Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion and weighted. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.18: Linear regression models predicting perceived seriousness of environmental problems in the United States (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0613**	**-0.0227**	**-0.0353**
	(0.0076)	(0.0064)	(0.0069)
Post-materialism index	0.0143	0.0067	**0.0251**
	(0.0074)	(0.0062)	(0.0075)
Interest in politics	-0.0134	0.0133	0.0002
	(0.0126)	(0.0091)	(0.0116)
Level of education	0.0028	-0.0020	0.0019
	(0.0086)	(0.0066)	(0.0080)
Attendance of religious services	**-0.0146**	-0.0025	**-0.0207**
	(0.0055)	(0.0044)	(0.0055)
Importance of God	**0.0162**	**0.0103**	**0.0192**
	(0.0046)	(0.0036)	(0.0047)
Protestant	-0.0449	-0.0083	-0.0160
	(0.0239)	(0.0162)	(0.0220)
Female	**0.0418**	**0.0357**	**0.0611**
	(0.0204)	(0.0153)	(0.0194)
Age younger than 30	-0.0176	-0.0273	-0.0424
	(0.0359)	(0.0254)	(0.0329)
Age 30-39	-0.0090	-0.0008	-0.0198
	(0.0303)	(0.0227)	(0.0278)
Age 50-59	0.0161	-0.0027	-0.0447
	(0.0302)	(0.0200)	(0.0277)
Age 60-69	0.0233	-0.0179	-0.0579
	(0.0391)	(0.0277)	(0.0376)
Age 70 and older	0.0265	0.0119	-0.0424
	(0.0388)	(0.0219)	(0.0352)
Intercept	1.0386	0.9602	0.9148
	(0.0572)	(0.0426)	(0.0503)
Number of respondents	1154	1149	1152
R^2	0.1732	0.0634	0.1244
adj. R^2	0.1637	0.0527	0.1144

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A6.19: Linear regression models predicting perceived seriousness of environmental problems in Italy (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0094**	-0.0012	-0.0072
	(0.0041)	(0.0026)	(0.0042)
Post-materialism index	-0.0024	**0.0126**	0.0030
	(0.0070)	(0.0048)	(0.0071)
Interest in politics	-0.0003	0.0017	0.0072
	(0.0103)	(0.0071)	(0.0103)
Level of education	-0.0047	-0.0005	-0.0033
	(0.0050)	(0.0036)	(0.0051)
Attendance of religious services	-0.0104	**-0.0105**	**-0.0149**
	(0.0073)	(0.0039)	(0.0059)
Importance of God	**0.0099**	**0.0098**	**0.0128**
	(0.0048)	(0.0030)	(0.0046)
Protestant	--	--	--
Female	0.0245	0.0187	0.0128
	(0.0170)	(0.0114)	(0.0170)
Age younger than 30	-0.0363	-0.0340	**-0.0503**
	(0.0246)	(0.0176)	(0.0253)
Age 30-39	-0.0102	-0.0188	0.0046
	(0.0219)	(0.0163)	(0.0215)
Age 50-59	-0.0013	-0.0108	-0.0450
	(0.0230)	(0.0163)	(0.0252)
Age 60-69	**-0.0588**	**-0.0425**	**-0.0837**
	(0.0281)	(0.0192)	(0.0286)
Age 70 and older	-0.0630	-0.0440	**-0.1004**
	(0.0455)	(0.0272)	(0.0441)
Intercept	0.9398	0.9312	0.9008
	(0.0298)	(0.0197)	(0.0298)
Number of respondents	674	681	674
R^2	0.0371	0.0520	0.0544
adj. R^2	0.0196	0.0350	0.0372

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.20: Linear regression models predicting perceived seriousness of environmental problems in Spain (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0163**	**-0.0158**	**-0.0155**
	(0.0031)	(0.0028)	(0.0031)
Post-materialism index	**-0.0122**	**-0.0089**	**-0.0174**
	(0.0044)	(0.0035)	(0.0042)
Interest in politics	**-0.0195**	**-0.0213**	**-0.0237**
	(0.0065)	(0.0065)	(0.0068)
Level of education	**0.0062**	0.0026	0.0048
	(0.0031)	(0.0025)	(0.0029)
Attendance of religious services	0.0005	0.0020	-0.0025
	(0.0037)	(0.0036)	(0.0041)
Importance of God	0.0020	0.0011	0.0021
	(0.0020)	(0.0019)	(0.0021)
Protestant	**0.0724**	**0.0509**	**0.0862**
	(0.0171)	(0.0188)	(0.0197)
Female	0.0024	0.0026	0.0123
	(0.0109)	(0.0099)	(0.0109)
Age younger than 30	0.0030	0.0061	0.0087
	(0.0171)	(0.0147)	(0.0172)
Age 30-39	-0.0014	-0.0102	-0.0013
	(0.0172)	(0.0157)	(0.0177)
Age 50-59	-0.0208	-0.0157	-0.0064
	(0.0204)	(0.0181)	(0.0203)
Age 60-69	0.0174	0.0056	0.0191
	(0.0199)	(0.0169)	(0.0205)
Age 70 and older	-0.0383	-0.0297	-0.0279
	(0.0227)	(0.0221)	(0.0230)
Intercept	0.9768	1.0025	0.9592
	(0.0214)	(0.0196)	(0.0238)
Number of respondents	952	954	954
R^2	0.0656	0.0650	0.0739
adj. R^2	0.0527	0.0520	0.0611

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.21: Linear regression models predicting perceived seriousness of environmental problems in Switzerland (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0249**	**-0.0138**	**-0.0119**
	(0.0047)	(0.0037)	(0.0044)
Post-materialism index	0.0114	0.0109	**0.0161**
	(0.0071)	(0.0056)	(0.0068)
Interest in politics	0.0108	0.0070	-0.0066
	(0.0113)	(0.0082)	(0.0098)
Level of education	0.0057	-0.0031	**-0.0148**
	(0.0052)	(0.0040)	(0.0049)
Attendance of religious services	-0.0044	-0.0054	0.0023
	(0.0054)	(0.0040)	(0.0050)
Importance of God	0.0051	-0.0001	-0.0030
	(0.0034)	(0.0024)	(0.0032)
Protestant	**-0.0349**	-0.0048	-0.0191
	(0.0173)	(0.0134)	(0.0167)
Female	**0.0669**	0.0199	**0.0535**
	(0.0171)	(0.0132)	(0.0166)
Age younger than 30	0.0227	0.0079	0.0308
	(0.0347)	(0.0270)	(0.0386)
Age 30-39	0.0480	0.0013	0.0087
	(0.0263)	(0.0210)	(0.0241)
Age 50-59	-0.0122	0.0206	0.0132
	(0.0243)	(0.0189)	(0.0255)
Age 60-69	0.0182	-0.0170	0.0039
	(0.0254)	(0.0195)	(0.0237)
Age 70 and older	-0.0236	0.0037	0.0475
	(0.0289)	(0.0221)	(0.0276)
Intercept	0.8602	0.9219	0.8158
	(0.0345)	(0.0272)	(0.0332)
Number of respondents	1015	1016	1016
R^2	0.1062	0.0480	0.0564
adj. R^2	0.0946	0.0356	0.0442

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.22: Linear regression models predicting perceived seriousness of environmental problems in South Korea (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0088** (0.0039)	-0.0029 (0.0041)	0.0004 (0.0036)
Post-materialism index	0.0013 (0.0076)	0.0036 (0.0074)	-0.0019 (0.0072)
Interest in politics	0.0116 (0.0096)	0.0022 (0.0105)	0.0055 (0.0098)
Level of education	0.0052 (0.0054)	0.0076 (0.0062)	**0.0204** (0.0052)
Attendance of religious services	-0.0002 (0.0043)	0.0046 (0.0044)	-0.0023 (0.0046)
Importance of God	-0.0003 (0.0034)	0.0002 (0.0036)	0.0041 (0.0034)
Protestant	-0.0005 (0.0204)	-0.0229 (0.0198)	-0.0168 (0.0182)
Female	-0.0018 (0.0139)	0.0035 (0.0142)	0.0049 (0.0148)
Age younger than 30	0.0020 (0.0199)	-0.0057 (0.0211)	-0.0218 (0.0215)
Age 30-39	0.0118 (0.0200)	0.0114 (0.0213)	-0.0138 (0.0200)
Age 50-59	0.0224 (0.0242)	0.0203 (0.0241)	0.0101 (0.0259)
Age 60-69	**-0.0809** (0.0276)	-0.0166 (0.0282)	-0.0442 (0.0283)
Age 70 and older	-0.1015 (0.0694)	0.0387 (0.0584)	0.0893 (0.0572)
Intercept	0.8737 (0.0322)	0.8080 (0.0347)	0.7512 (0.0342)
Number of respondents	1187	1187	1187
R^2	0.0703	0.0175	0.0583
adj. R^2	0.0600	0.0066	0.0479

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.23: Linear regression models predicting perceived seriousness of environmental problems in Norway (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0102**	-0.0059	**-0.0091**
	(0.0037)	(0.0032)	(0.0034)
Post-materialism index	**0.0317**	**0.0158**	**0.0306**
	(0.0071)	(0.0055)	(0.0061)
Interest in politics	0.0065	0.0105	0.0098
	(0.0111)	(0.0081)	(0.0100)
Level of education	**0.0153**	0.0048	0.0010
	(0.0045)	(0.0035)	(0.0041)
Attendance of religious services	0.0054	-0.0044	0.0013
	(0.0053)	(0.0042)	(0.0049)
Importance of God	0.0019	**0.0054**	0.0015
	(0.0030)	(0.0023)	(0.0028)
Protestant	-0.0294	**-0.0357**	**-0.0506**
	(0.0154)	(0.0119)	(0.0134)
Female	**0.0353**	**0.0299**	0.0238
	(0.0144)	(0.0117)	(0.0129)
Age younger than 30	-0.0317	-0.0034	0.0099
	(0.0221)	(0.0191)	(0.0196)
Age 30-39	**-0.0425**	-0.0040	-0.0180
	(0.0216)	(0.0179)	(0.0198)
Age 50-59	-0.0280	0.0197	-0.0182
	(0.0225)	(0.0188)	(0.0199)
Age 60-69	-0.0320	0.0122	-0.0084
	(0.0240)	(0.0194)	(0.0217)
Age 70 and older	0.0158	**0.0555**	0.0249
	(0.0306)	(0.0236)	(0.0285)
Intercept	0.8847	0.9093	0.9224
	(0.0330)	(0.0268)	(0.0289)
Number of respondents	966	969	969
R^2	0.0820	0.0541	0.0704
adj. R^2	0.0695	0.0413	0.0578

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.24: Linear regression models predicting perceived seriousness of environmental problems in Finland (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0096**	**-0.0079**	**-0.0098**
	(0.0041)	(0.0033)	(0.0043)
Post-materialism index	0.0114	0.0023	0.0009
	(0.0072)	(0.0056)	(0.0076)
Interest in politics	0.0046	**0.0189**	0.0085
	(0.0102)	(0.0081)	(0.0106)
Level of education	**0.0112**	0.0048	0.0035
	(0.0043)	(0.0036)	(0.0048)
Attendance of religious services	-0.0002	-0.0041	0.0073
	(0.0057)	(0.0048)	(0.0063)
Importance of God	0.0010	0.0044	0.0001
	(0.0033)	(0.0027)	(0.0034)
Protestant	--	--	--
Female	**0.0559**	**0.0563**	**0.0666**
	(0.0161)	(0.0137)	(0.0174)
Age younger than 30	-0.0199	**-0.0463**	-0.0036
	(0.0254)	(0.0218)	(0.0259)
Age 30-39	0.0057	-0.0212	-0.0322
	(0.0232)	(0.0190)	(0.0263)
Age 50-59	-0.0063	**-0.0403**	-0.0421
	(0.0246)	(0.0204)	(0.0267)
Age 60-69	-0.0018	-0.0430	-0.0411
	(0.0282)	(0.0238)	(0.0296)
Age 70 and older	0.0152	-0.0422	-0.0156
	(0.0285)	(0.0258)	(0.0334)
Intercept	0.8236	0.8993	0.7970
	(0.0306)	(0.0246)	(0.0325)
Number of respondents	847	853	847
R^2	0.0413	0.0544	0.0393
adj. R^2	0.0275	0.0409	0.0255

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.25: Linear regression models predicting perceived seriousness of environmental problems in Germany (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0099**	**-0.0123**	**-0.0151**
	(0.0037)	(0.0038)	(0.0037)
Post-materialism index	0.0105	0.0057	**0.0153**
	(0.0060)	(0.0061)	(0.0061)
Interest in politics	0.0103	**0.0339**	0.0142
	(0.0079)	(0.0097)	(0.0080)
Level of education	**0.0095**	0.0058	**0.0098**
	(0.0035)	(0.0040)	(0.0035)
Attendance of religious services	-0.0001	**-0.0169**	**-0.0113**
	(0.0051)	(0.0059)	(0.0052)
Importance of God	0.0024	**0.0072**	0.0039
	(0.0028)	(0.0031)	(0.0028)
Protestant	--	--	--
Female	**0.0347**	**0.0602**	**0.0524**
	(0.0125)	(0.0139)	(0.0137)
Age younger than 30	-0.0181	0.0070	-0.0051
	(0.0215)	(0.0236)	(0.0222)
Age 30-39	0.0023	-0.0126	-0.0197
	(0.0196)	(0.0218)	(0.0226)
Age 50-59	0.0096	-0.0230	-0.0176
	(0.0210)	(0.0254)	(0.0222)
Age 60-69	0.0092	-0.0034	-0.0103
	(0.0200)	(0.0211)	(0.0210)
Age 70 and older	0.0063	-0.0404	-0.0162
	(0.0217)	(0.0216)	(0.0229)
Intercept	0.8249	0.7774	0.7662
	(0.0276)	(0.0285)	(0.0259)
Number of respondents	1648	1664	1656
R^2	0.0361	0.0582	0.0524
adj. R^2	0.0290	0.0513	0.0455

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.26: Linear regression models predicting perceived seriousness of environmental problems in Canada (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0128**	**-0.0074**	**-0.0136**
	(0.0046)	(0.0031)	(0.0038)
Post-materialism index	0.0057	0.0061	0.0075
	(0.0061)	(0.0039)	(0.0062)
Interest in politics	0.0076	-0.0028	0.0001
	(0.0079)	(0.0053)	(0.0071)
Level of education	-0.0051	-0.0034	0.0017
	(0.0045)	(0.0044)	(0.0053)
Attendance of religious services	-0.0047	0.0000	-0.0047
	(0.0039)	(0.0044)	(0.0050)
Importance of God	0.0037	0.0029	0.0041
	(0.0028)	(0.0029)	(0.0033)
Protestant	-0.0111	0.0062	-0.0091
	(0.0194)	(0.0140)	(0.0202)
Female	**0.0333**	0.0129	0.0277
	(0.0138)	(0.0121)	(0.0150)
Age younger than 30	-0.0171	-0.0060	0.0314
	(0.0203)	(0.0158)	(0.0192)
Age 30-39	-0.0145	-0.0030	0.0032
	(0.0221)	(0.0157)	(0.0224)
Age 50-59	-0.0061	-0.0048	0.0146
	(0.0189)	(0.0144)	(0.0206)
Age 60-69	-0.0267	-0.0381	-0.0368
	(0.0236)	(0.0292)	(0.0322)
Age 70 and older	-0.0351	0.0074	-0.0341
	(0.0272)	(0.0178)	(0.0289)
Intercept	0.9348	0.9654	0.9041
	(0.0318)	(0.0248)	(0.0289)
Number of respondents	1526	1554	1538
R^2	0.0296	0.0223	0.0413
adj. R^2	0.0212	0.0141	0.0332

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.27: Linear regression models predicting perceived seriousness of environmental problems in Australia (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0125**	-0.0022	-0.0035
	(0.0040)	(0.0023)	(0.0036)
Post-materialism index	0.0070	0.0056	**0.0197**
	(0.0055)	(0.0037)	(0.0049)
Interest in politics	0.0071	0.0080	0.0068
	(0.0080)	(0.0052)	(0.0077)
Level of education	-0.0008	0.0008	-0.0017
	(0.0041)	(0.0027)	(0.0040)
Attendance of religious services	-0.0049	-0.0037	-0.0071
	(0.0045)	(0.0029)	(0.0040)
Importance of God	0.0017	-0.0002	-0.0013
	(0.0026)	(0.0018)	(0.0023)
Protestant	0.0028	-0.0011	-0.0026
	(0.0149)	(0.0096)	(0.0146)
Female	**0.0439**	**0.0222**	**0.0319**
	(0.0131)	(0.0090)	(0.0128)
Age younger than 30	-0.0025	-0.0134	0.0147
	(0.0210)	(0.0156)	(0.0212)
Age 30-39	0.0048	-0.0239	0.0266
	(0.0220)	(0.0166)	(0.0206)
Age 50-59	0.0144	0.0004	0.0170
	(0.0194)	(0.0124)	(0.0183)
Age 60-69	-0.0210	-0.0139	-0.0023
	(0.0217)	(0.0135)	(0.0206)
Age 70 and older	-0.0439	-0.0271	-0.0416
	(0.0256)	(0.0162)	(0.0244)
Intercept	0.8977	0.9334	0.8444
	(0.0288)	(0.0183)	(0.0272)
Number of respondents	1245	1246	1245
R^2	0.0402	0.0208	0.0448
adj. R^2	0.0300	0.0104	0.0347

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.28: Linear regression models predicting perceived seriousness of environmental problems in Japan (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0072	-0.0024	**-0.0103**
	(0.0037)	(0.0042)	(0.0049)
Post-materialism index	0.0045	0.0092	**0.0187**
	(0.0057)	(0.0064)	(0.0072)
Interest in politics	0.0153	0.0147	0.0219
	(0.0098)	(0.0107)	(0.0135)
Level of education	0.0033	-0.0009	0.0042
	(0.0050)	(0.0051)	(0.0065)
Attendance of religious services	0.0015	0.0080	0.0010
	(0.0058)	(0.0062)	(0.0072)
Importance of God	0.0040	0.0049	0.0048
	(0.0027)	(0.0030)	(0.0035)
Protestant	-0.0243	-0.0508	0.0681
	(0.0668)	(0.0691)	(0.0660)
Female	**0.0421**	**0.0420**	**0.0397**
	(0.0130)	(0.0145)	(0.0174)
Age younger than 30	-0.0082	0.0183	0.0200
	(0.0211)	(0.0236)	(0.0275)
Age 30-39	0.0168	0.0108	0.0130
	(0.0220)	(0.0250)	(0.0257)
Age 50-59	-0.0224	-0.0000	-0.0159
	(0.0192)	(0.0223)	(0.0232)
Age 60-69	-0.0200	-0.0127	-0.0376
	(0.0215)	(0.0235)	(0.0255)
Age 70 and older	-0.0297	-0.0371	0.0047
	(0.0256)	(0.0292)	(0.0327)
Intercept	0.9217	0.8535	0.8351
	(0.0293)	(0.0318)	(0.0375)
Number of respondents	673	671	667
R^2	0.0345	0.0326	0.0446
adj. R^2	0.0154	0.0134	0.0256

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.29: Linear regression models predicting perceived seriousness of environmental problems in Mexico (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0019	-0.0009	-0.0009
	(0.0024)	(0.0019)	(0.0022)
Post-materialism index	**-0.0136**	-0.0019	-0.0077
	(0.0061)	(0.0046)	(0.0053)
Interest in politics	0.0110	0.0119*	0.0057
	(0.0066)	(0.0048)	(0.0058)
Level of education	**0.0238**	0.0168*	**0.0201***
	(0.0034)	(0.0028)	(0.0033)
Attendance of religious services	**-0.0113**	-0.0037	-0.0053
	(0.0036)	(0.0027)	(0.0033)
Importance of God	0.0066	0.0078	**0.0092***
	(0.0050)	(0.0040)	(0.0046)
Protestant	**0.0964**	0.0711*	**0.0787***
	(0.0350)	(0.0139)	(0.0260)
Female	-0.0221	-0.0088	-0.0124
	(0.0137)	(0.0106)	(0.0121)
Age younger than 30	**-0.0478**	-0.0037	-0.0087
	(0.0204)	(0.0159)	(0.0182)
Age 30-39	0.0224	-0.0065	0.0098
	(0.0204)	(0.0162)	(0.0190)
Age 50-59	0.0315	0.0122	0.0183
	(0.0252)	(0.0210)	(0.0239)
Age 60-69	0.0491	0.0190	0.0473
	(0.0294)	(0.0231)	(0.0253)
Age 70 and older	0.0505	**0.0743**	0.0205
	(0.0370)	(0.0225)	(0.0389)
Intercept	0.8512	0.9046	0.8624
	(0.0317)	(0.0268)	(0.0296)
Number of respondents	1220	1240	1240
R^2	0.0789	0.0584	0.0525
adj. R^2	0.0689	0.0484	0.0424

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.30: Linear regression models predicting perceived seriousness of environmental problems in Slovenia (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	-0.0062	-0.0049	-0.0064
	(0.0044)	(0.0040)	(0.0045)
Post-materialism index	0.0079	-0.0062	-0.0064
	(0.0090)	(0.0079)	(0.0094)
Interest in politics	**0.0279**	0.0137	0.0163
	(0.0114)	(0.0105)	(0.0117)
Level of education	-0.0062	-0.0023	-0.0067
	(0.0053)	(0.0046)	(0.0054)
Attendance of religious services	-0.0030	-0.0050	-0.0010
	(0.0060)	(0.0050)	(0.0057)
Importance of God	0.0032	0.0020	0.0004
	(0.0035)	(0.0029)	(0.0035)
Protestant	-0.0905	-0.0630	-0.0048
	(0.0949)	(0.0784)	(0.0803)
Female	-0.0044	0.0140	0.0273
	(0.0179)	(0.0153)	(0.0178)
Age younger than 30	-0.0047	0.0108	0.0157
	(0.0274)	(0.0238)	(0.0268)
Age 30-39	-0.0415	0.0053	-0.0142
	(0.0301)	(0.0237)	(0.0295)
Age 50-59	0.0007	0.0051	0.0017
	(0.0277)	(0.0245)	(0.0284)
Age 60-69	-0.0019	0.0145	-0.0021
	(0.0308)	(0.0242)	(0.0337)
Age 70 and older	-0.0118	-0.0329	-0.0376
	(0.0336)	(0.0368)	(0.0390)
Intercept	0.9019	0.8992	0.8613
	(0.0338)	(0.0293)	(0.0343)
Number of respondents	571	589	585
R^2	0.0296	0.0165	0.0156
adj. R^2	0.0070	-0.0058	-0.0068

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.31: Linear regression models predicting perceived seriousness of environmental problems in Turkey (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0076**	-0.0023	-0.0046
	(0.0022)	(0.0021)	(0.0027)
Post-materialism index	**-0.0097**	**-0.0133**	**-0.0137**
	(0.0040)	(0.0038)	(0.0051)
Interest in politics	-0.0010	0.0048	0.0089
	(0.0050)	(0.0048)	(0.0067)
Level of education	**0.0052**	**0.0079**	**0.0078**
	(0.0025)	(0.0024)	(0.0030)
Attendance of religious services	0.0020	0.0032	0.0041
	(0.0027)	(0.0028)	(0.0037)
Importance of God	0.0037	-0.0002	0.0018
	(0.0028)	(0.0026)	(0.0036)
Protestant	--	--	--
Female	0.0118	0.0012	-0.0111
	(0.0118)	(0.0104)	(0.0149)
Age younger than 30	**-0.0311**	-0.0167	-0.0263
	(0.0118)	(0.0116)	(0.0138)
Age 30-39	-0.0183	-0.0064	-0.0210
	(0.0143)	(0.0147)	(0.0178)
Age 50-59	-0.0268	0.0040	-0.0324
	(0.0183)	(0.0171)	(0.0234)
Age 60-69	0.0034	-0.0675	-0.0667
	(0.0254)	(0.0364)	(0.0440)
Age 70 and older	0.0037	0.0038	-0.0224
	(0.0258)	(0.0305)	(0.0362)
Intercept	0.9872	0.9644	0.9634
	(0.0177)	(0.0191)	(0.0233)
Number of respondents	1028	1044	1038
R^2	0.0324	0.0425	0.0376
adj. R^2	0.0210	0.0314	0.0263

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.32: Linear regression models predicting perceived seriousness of environmental problems in Chile (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology	0.0002	-0.0004	-0.0033
(from left to right)	(0.0043)	(0.0033)	(0.0040)
Post-materialism index	0.0090	0.0039	0.0050
	(0.0068)	(0.0054)	(0.0056)
Interest in politics	0.0133	0.0026	0.0134
	(0.0107)	(0.0080)	(0.0080)
Level of education	**0.0129**	**0.0101**	0.0051
	(0.0055)	(0.0044)	(0.0039)
Attendance of religious services	-0.0006	-0.0048	-0.0072
	(0.0058)	(0.0043)	(0.0042)
Importance of God	0.0095	**0.0145**	**0.0147**
	(0.0049)	(0.0040)	(0.0045)
Protestant	-0.0063	-0.0290	-0.0315
	(0.0300)	(0.0257)	(0.0280)
Female	0.0113	0.0164	**0.0364***
	(0.0192)	(0.0173)	(0.0178)
Age younger than 30	-0.0462	-0.0304	-0.0105
	(0.0274)	(0.0247)	(0.0208)
Age 30-39	-0.0206	-0.0056	0.0048
	(0.0256)	(0.0182)	(0.0202)
Age 50-59	-0.0566	-0.0124	-0.0507
	(0.0296)	(0.0264)	(0.0287)
Age 60-69	0.0144	0.0113	0.0192
	(0.0352)	(0.0259)	(0.0352)
Age 70 and older	-0.0036	-0.0142	-0.0135
	(0.0358)	(0.0392)	(0.0404)
Intercept	0.8853	0.8866	0.8808
	(0.0325)	(0.0295)	(0.0296)
Number of respondents	625	635	632
R^2	0.0509	0.0621	0.0725
adj. R^2	0.0307	0.0425	0.0530

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.33: Linear regression models predicting perceived seriousness of environmental problems in Poland (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology	-0.0010	-0.0015	-0.0022
(from left to right)	(0.0040)	(0.0034)	(0.0041)
Post-materialism index	0.0010	0.0071	0.0031
	(0.0096)	(0.0079)	(0.0092)
Interest in politics	0.0111	**0.0255**	0.0135
	(0.0113)	(0.0095)	(0.0112)
Level of education	-0.0052	-0.0034	-0.0049
	(0.0054)	(0.0046)	(0.0052)
Attendance of religious services	-0.0041	-0.0064	-0.0037
	(0.0072)	(0.0053)	(0.0072)
Importance of God	**0.0133**	**0.0092**	**0.0163**
	(0.0060)	(0.0041)	(0.0057)
Protestant	0.0776	**0.1126**	0.0342
	(0.0732)	(0.0199)	(0.0840)
Female	-0.0285	-0.0016	0.0089
	(0.0171)	(0.0148)	(0.0168)
Age younger than 30	0.0486	0.0227	0.0276
	(0.0284)	(0.0238)	(0.0281)
Age 30-39	**0.0636**	**0.0565**	0.0491
	(0.0300)	(0.0245)	(0.0302)
Age 50-59	0.0357	0.0332	0.0509*
	(0.0264)	(0.0218)	(0.0255)
Age 60-69	0.0581	0.0345	0.0499
	(0.0315)	(0.0268)	(0.0296)
Age 70 and older	0.0229	0.0174	0.0264
	(0.0353)	(0.0295)	(0.0336)
Intercept	0.7840	0.8678	0.7830
	(0.0341)	(0.0277)	(0.0345)
Number of respondents	671	675	674
R^2	0.0329	0.0369	0.0400
adj. R^2	0.0138	0.0179	0.0211

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A6.34: Linear regression models predicting perceived seriousness of environmental problems in Sweden (World Values Survey 2005-2009)

	(1) Global warming or the greenhouse effect	(2) Pollution of rivers, lakes, and oceans	(3) Loss of plant or animal species or biodiversity
Political ideology (from left to right)	**-0.0093**	-0.0045	**-0.0130**
	(0.0034)	(0.0028)	(0.0035)
Post-materialism index	0.0068	0.0068	-0.0007
	(0.0064)	(0.0048)	(0.0068)
Interest in politics	0.0056	0.0121	0.0097
	(0.0089)	(0.0074)	(0.0097)
Level of education	0.0052	0.0015	-0.0070
	(0.0044)	(0.0034)	(0.0048)
Attendance of religious services	-0.0007	-0.0050	-0.0110
	(0.0058)	(0.0047)	(0.0065)
Importance of God	0.0013	-0.0008	0.0020
	(0.0027)	(0.0021)	(0.0028)
Protestant	-0.2259	-0.1451	-0.0956
	(0.1586)	(0.1910)	(0.1872)
Female	**0.0491**	**0.0561**	**0.0629**
	(0.0148)	(0.0108)	(0.0145)
Age younger than 30	-0.0297	-0.0283	0.0097
	(0.0239)	(0.0177)	(0.0221)
Age 30-39	0.0055	-0.0255	-0.0183
	(0.0226)	(0.0190)	(0.0240)
Age 50-59	0.0017	0.0132	0.0085
	(0.0214)	(0.0152)	(0.0211)
Age 60-69	-0.0341	-0.0317	-0.0312
	(0.0253)	(0.0201)	(0.0262)
Age 70 and older	0.0098	0.0096	-0.0281
	(0.0280)	(0.0205)	(0.0310)
Intercept	0.8852	0.8963	0.8879
	(0.0295)	(0.0227)	(0.0295)
Number of respondents	915	925	923
R^2	0.0462	0.0596	0.0570
adj. R^2	0.0324	0.0462	0.0435

OLS coefficients. Standard errors in parentheses. $p < 0.05$ in **bold.** Listwise deletion. Data weighted. The dependent variable ranges from 0 to 1 (0 = not serious at all; 0.33 = not very serious; somewhat serious = 0.67; 1.0 = very serious). Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.35: Regression models predicting climate change attitudes in United States (interaction between political ideology and political knowledge (2008 and 2012 American National Elections Studies)

	Concern about climate change Linear (2008 ANES)	Belief in climate change scale Linear (2008 ANES)	Cause of climate change – human activity Binary logit (2008 ANES)	Cause of climate change – human activity Binary logit (2012 ANES)
Political ideology	-0.0285	-0.1133	0.1011	0.0055
(liberal to conservative)	(0.0180)	(0.1811)	(0.1242)	(0.0893)
Political knowledge	**0.0374**	**0.5075**	**0.6032**	**0.8256**
	(0.0165)	(0.1694)	(0.1384)	(0.1384)
Political ideology X	**-0.0101**	**-0.1662**	**-0.1250**	**-0.1847**
Political knowledge	(0.0039)	(0.0418)	(0.0307)	(0.0337)
Biblical literalism	**0.0451**	0.3937	**0.2845**	**0.1409**
	(0.0188)	(0.2104)	(0.1322)	(0.0413)
Level of education	0.0152	0.0664	-0.1004	**0.1688**
	(0.0094)	(0.1118)	(0.0789)	(0.0626)
Age younger than 30	0.0086	0.2539	-0.1865	0.1458
	(0.0420)	(0.4974)	(0.2870)	(0.1468)
Age 30-39	0.0438	-0.3858	0.0336	0.0890
	(0.0350)	(0.3727)	(0.2669)	(0.1478)
Age 50-59	-0.0119	-0.0648	-0.2262	-0.0176
	(0.0328)	(0.3503)	(0.2252)	(0.1355)
Age 60-69	0.0011	0.0028	-0.5142	**-0.4321**
	(0.0331)	(0.3718)	(0.2641)	(0.1422)
Age 70 and older	-0.0044	-0.4486	-0.2085	**-0.3588**
	(0.0370)	(0.3941)	(0.2914)	(0.1641)
Female	0.0288	0.4447	-0.0255	-0.0140
	(0.0239)	(0.2433)	(0.1750)	(0.0879)
Constant	0.5817	6.3330	-1.2585	-1.5936
	(0.0944)	(0.8406)	(0.6651)	(0.4103)
Number of respondents	1065	759	1386	4919
AIC	144	3488	1671	5682

OLS or logit coefficient estimate. Standard errors in parentheses. Two tailed *p*-value<0.05 in **bold**. Data are weighted. Listwise deletion. Political knowledge ranges from 0 to 6 for the 2008 American National Elections Study and 0 to 5 for the 2012 American National Elections Study.

Table A4.36: Regression models predicting climate change attitudes in United States for liberals and conservatives (2008 and 2012 American National Elections Studies)

	Concern about climate change Linear 2008 ANES		Belief in climate change scale Linear 2008 ANES		Cause of climate change – human activity Binary logit 2008 ANES	
	Liberals	Conservatives	Liberals	Conservatives	Liberals	Conservatives
Political knowledge	0.0169	**-0.0242**	**0.2224**	**-0.5228**	**0.2536**	-0.0666
	(0.0105)	(0.0124)	(0.1093)	(0.1572)	(0.0957)	(0.0886)
Biblical literalism	**0.0482**	**0.0538**	**0.6003**	0.4021	**0.5647**	0.1613
	(0.0291)	(0.0253)	(0.2817)	(0.3116)	(0.2154)	(0.1761)
Level of education	0.0149	0.0082	0.0838	0.0083	-0.0595	-0.1783
	(0.0165)	(0.0127)	(0.1506)	(0.1625)	(0.1243)	(0.1084)
Age younger than 30	0.0342	-0.0637	0.5883	0.0092	0.0990	-0.6298
	(0.0494)	(0.0702)	(0.5716)	(0.9534)	(0.4310)	(0.4442)
Age 30-39	**0.1184**	0.0223	-0.3428	-0.0527	-0.4055	0.3245
	(0.0496)	(0.0478)	(0.5670)	(0.5164)	(0.3994)	(0.3367)
Age 50-59	0.0515	-0.0299	**0.6443**	-0.1745	-0.1497	-0.1230
	(0.0569)	(0.0431)	(0.3831)	(0.5260)	(0.3693)	(0.2978)
Age 60-69	0.0404	-0.0181	0.1558	-0.0015	-0.3332	**-0.7260**
	(0.0507)	(0.0485)	(0.4607)	(0.5874)	(0.4389)	(0.3516)
Age 70 and older	**0.0911**	-0.0411	0.0076	-0.7420	0.4617	-0.5845
	(0.0415)	(0.0519)	(0.4910)	(0.5721)	(0.4833)	(0.4547)
Female	0.0093	**0.0940**	**0.5762**	**0.7896**	-0.3825	0.3260
	(0.0362)	(0.0352)	(0.3168)	(0.4018)	(0.2893)	(0.2462)
Constant	0.4723	0.4274	4.9603	5.9284	-1.4577	-0.4869
	(0.0950)	(0.0841)	(0.6784)	(0.9259)	(0.6610)	(0.5417)
Number of respondents	358	578	287	386	475	756
AIC	-43	175	1154	1892	582	918

Table A4.36 (cont'd)

	Cause of climate change – human activity Binary logit 2012 ANES	
	Liberals	Conservatives
Political knowledge	**0.3033**	-0.1377
	(0.0882)	(0.0924)
Biblical literalism	**0.2803**	-0.0172
	(0.0674)	(0.0785)
Level of education	**0.2405**	0.0781
	(0.1085)	(0.1208)
Age younger than 30	**0.4239**	0.0668
	(0.2521)	(0.2880)
Age 30-39	0.2086	0.2935
	(0.2470)	(0.2697)
Age 50-59	-0.0803	0.1904
	(0.2325)	(0.2343)
Age 60-69	**-0.4787**	-0.3958
	(0.2417)	(0.2535)
Age 70 and older	-0.1071	**-0.5535**
	(0.2968)	(0.3000)
Female	0.0396	**0.3071**
	(0.1531)	(0.1564)
Constant	-2.0881	-1.3002
	(0.3620)	(0.3993)
Number of respondents	1417	1794
AIC	1754	1879

OLS or logit coefficient estimate. Standard errors in parentheses. Two tailed p-value<0.1 in **bold**. Listwise deletion Data are weighted. Liberals were those who said their political ideology was "very liberal", "liberal, or "moderately liberal". Conservatives were those who said their political ideology was "very conservative", "conservative", or "moderately conservative". Political knowledge ranges from 0 to 6 for the 2008 American National Elections Study and 0 to 5 for the 2012 American National Elections Study.

Table A4.37: Regression models predicting climate change attitudes in United States for liberals and conservatives – interest in politics instead of political knowledge (2008 American National Elections Study)

	Concern about climate change Linear (2008 ANES)	Belief in climate change scale Linear (2008 ANES)	Cause of climate change – human activity Binary logit (2008 ANES)
Political ideology (liberal to conservative)	-0.0139 (0.0249)	-0.0937 (0.2625)	0.0682 (0.1674)
Interest in politics	**0.0896** (0.0291)	**0.7090** (0.3037)	**0.6093** (0.2145)
Political ideology X Interest in politics	**-0.0145** (0.0063)	**-0.1809** (0.0655)	**-0.1122** (0.0441)
Biblical literalism	**0.0412** (0.0184)	0.3576 (0.2087)	**0.3059** (0.1309)
Level of education	0.0088 (0.0099)	-0.0187 (0.1086)	-0.0864 (0.0764)
Age younger than 30	0.0068 (0.0412)	0.0663 (0.5067)	-0.2497 (0.2929)
Age 30-39	0.0401 (0.0354)	-0.5685 (0.3667)	-0.0319 (0.2765)
Age 50-59	-0.0294 (0.0339)	-0.1664 (0.3820)	-0.2979 (0.2300)
Age 60-69	-0.0213 (0.0339)	-0.1425 (0.4090)	**-0.5655** (0.2616)
Age 70 and older	-0.0409 (0.0373)	-0.7851 (0.4365)	-0.3267 (0.2860)
Female	0.0320 (0.0234)	**0.5057** (0.2473)	-0.0806 (0.1695)
Constant	0.4342 (0.1297)	6.1286 (1.2857)	-1.3419 (0.8908)
Number of respondents	1064	758	1385
AIC	137	3510	1690

Standard errors in parentheses. Two tailed *p*-value<0.05 in **bold**. Data are weighted.

Table A4.38: Binary logistic model predicting cause of climate change in United States for liberals and conservatives –attention to politics instead of political knowledge (2012 American National Elections Study)

	Cause of climate change – human activity Binary logit (2012 ANES)
Political ideology (from left to right)	-0.1580
	(0.1043)
Attention to politics	**0.3253**
	(0.1181)
Political ideology X Attention to politics	**-0.0823**
	(0.0284)
Level of education	**0.1691**
	(0.0401)
Biblical literalism	**0.1939**
	(0.0619)
Age younger than 30	0.1480
	(0.1472)
Age 30-39	0.1070
	(0.1465)
Age 50-59	0.0038
	(0.1353)
Age 60-69	**-0.3703**
	(0.1395)
Age 70 and older	-0.2886
	(0.1632)
Female	-0.0368
	(0.0881)
Constant	-0.8629
	(0.4749)
Number of respondents	4919
AIC	5730

Standard errors in parentheses. Two tailed *p*-value<0.05 in **bold**. Data are weighted.

Table A4.39: Regression models predicting climate change attitudes in United States for liberals and conservatives – interest in politics instead of political knowledge (2008 American National Elections Studies)

	Concern about climate change Linear 2008 ANES		Belief in climate change scale Linear 2008 ANES		Cause of climate change Binary logit 2008 ANES	
	Liberal	Conservative	Liberal	Conservative	Liberal	Conservative
Interest in politics	**0.0632**	-0.0101	**0.3914**	**-0.3872**	0.2654	-0.0639
	(0.0200)	(0.0160)	(0.2035)	(0.2161)	(0.1625)	(0.1107)
Biblical literalism	**0.0550**	**0.0496**	**0.6923**	0.3498	**0.6484**	0.1425
	(0.0288)	(0.0249)	(0.2876)	(0.3008)	(0.2109)	(0.1756)
Level of education	0.0067	0.0004	0.0793	-0.1608	-0.0150	**-0.1942**
	(0.0167)	(0.0135)	(0.1322)	(0.1678)	(0.1221)	(0.1057)
Age younger than 30	0.0515	-0.0864	0.6699	-0.5295	0.0815	-0.7073
	(0.0522)	(0.0642)	(0.6009)	(0.9334)	(0.4360)	(0.4456)
Age 30-39	**0.1065**	0.0175	-0.5214	-0.3345	-0.5143	0.2941
	(0.0482)	(0.0490)	(0.5232)	(0.5267)	(0.4149)	(0.3373)
Age 50-59	0.0321	-0.0388	0.4550	-0.1950	-0.2039	-0.1433
	(0.0530)	(0.0456)	(0.3884)	(0.5727)	(0.3621)	(0.3058)
Age 60-69	0.0092	-0.0336	0.0281	-0.1356	-0.3661	**-0.7756**
	(0.0504)	(0.0489)	(0.4846)	(0.6396)	(0.4284)	(0.3593)
Age 70 and older	0.0433	-0.0603	-0.2909	**-1.1754**	0.3523	-0.6381
	(0.0428)	(0.0516)	(0.5545)	(0.6378)	(0.4692)	(0.4512)
Female	-0.0041	**0.1063**	0.3526	**1.1119**	**-0.5658**	0.3440
	(0.0339)	(0.0353)	(0.3024)	(0.4128)	(0.2801)	(0.2405)
Constant	0.3354	0.4080	4.3931	5.9543	-1.6643	-0.4046
	(0.1064)	(0.0829)	(0.8897)	(1.0382)	(0.7647)	(0.5937)
Number of respondents	358	577	287	385	475	755
AIC	-63	182	1150	1906	588	918

Standard errors in parentheses. Two tailed *p*-value<0.1 in **bold**. Data are weighted.

Table A4.40: Binary logistic models predicting cause of climate change in United States for liberals and conservatives –attention to politics instead of political knowledge (2012 American National Elections Studies)

	Cause of climate change – human activity Binary logit (2012 ANES)	
	Liberals	conservatives
Attention to politics	0.0970	**-0.1971**
	(0.0702)	(0.0748)
Level of education	**0.3361**	-0.0158
	(0.0653)	(0.0765)
Biblical literalism	**0.2899**	0.0608
	(0.1075)	(0.1207)
Age younger than 30	0.3808	0.0815
	(0.2485)	(0.2867)
Age 30-39	0.2299	0.3081
	(0.2474)	(0.2706)
Age 50-59	-0.0461	0.2227
	(0.2310)	(0.2366)
Age 60-69	-0.4071	-0.3305
	(0.2364)	(0.2564)
Age 70 and older	-0.0103	-0.4693
	(0.2972)	(0.3049)
Female	-0.0082	0.2642
	(0.1513)	(0.1606)
Constant	-1.9361	-0.9502
	(0.4043)	(0.4456)
Number of respondents	1417	1794
AIC	1772	1871

Standard errors in parentheses. Two tailed p-value<0.05 in **bold**. Data are weighted.

Table A4.41: Ordered logistic regression models predicting perceived seriousness of environmental problems in the United States among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	**0.6824**	0.3766	**0.5879**
(low; medium; high)	(0.2365)	(0.2925)	(0.2068)
Level of education	0.0408	0.2682	0.2275
	(0.1821)	(0.2018)	(0.1719)
Lower class	-0.8200	-0.4764	-0.6289
	(1.4350)	(1.4862)	(1.2696)
Working class	0.1747	-0.3950	-0.0592
	(0.5252)	(0.5795)	(0.5288)
Upper class	-0.4602	-1.1160*	**-0.6918**
	(0.4283)	(0.4678)	(0.4146)
Female	0.4630	1.1068*	0.5588
	(0.3917)	(0.4448)	(0.3763)
Age younger than 30	-0.3977	-0.2264	-1.1775
	(0.7623)	(0.7118)	(0.7818)
Age 30-39	-0.0527	**1.0746**	-0.1564
	(0.5854)	(0.6204)	(0.5102)
Age 50-59	0.5823	0.7634	-0.1133
	(0.5532)	(0.5081)	(0.4787)
Age 60-69	-0.3569	-0.1589	**-1.2926**
	(0.6419)	(0.8144)	(0.7099)
Age 70 and older	**2.5007**	**2.4563**	0.4559
	(1.1475)	(1.0874)	(0.6653)
Not serious at all | Not very serious	-3.8007		-4.3308
	(0.7272)		(0.8213)
Not very serious | Somewhat serious	-1.9782	-2.3730	-2.3052
	(0.7098)	(0.6403)	(0.5960)
Somewhat serious | Very serious	-0.1914	-0.1249	-0.0949
	(0.6896)	(0.6831)	(0.6230)
Number of respondents	205	206	206
AIC	387	273	391

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.42: Ordered logistic regression models predicting perceived seriousness of environmental problems in the United States among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	**-0.3708**	0.0782	-0.0901
(low; medium; high)	(0.2238)	(0.2227)	(0.2164)
Level of education	-0.1071	-0.0963	-0.1393
	(0.1123)	(0.1304)	(0.1154)
Lower class	**2.3399**	1.7934	**15.8900**
	(1.0146)	(1.1637)	(0.5748)
Working class	-0.0386	0.4168	0.1164
	(0.3544)	(0.3859)	(0.3833)
Upper class	0.1763	0.1328	0.4464
	(0.3017)	(0.3158)	(0.2902)
Female	0.2840	0.1856	**0.4969**
	(0.2793)	(0.2853)	(0.2992)
Age younger than 30	-0.5962	-0.3183	-0.6645
	(0.4234)	(0.4700)	(0.4578)
Age 30-39	**-0.6028**	-0.0914	**-0.7480**
	(0.3246)	(0.4168)	(0.4089)
Age 50-59	-0.7510	-0.5763	**-1.2833**
	(0.5565)	(0.4516)	(0.4963)
Age 60-69	-0.1599	0.0342	-0.3889
	(0.4084)	(0.5106)	(0.4960)
Age 70 and older	-0.3168	-0.1933	-0.8308
	(0.4513)	(0.4252)	(0.5096)
Not serious at all | Not very serious	-1.9191	-3.3955	-2.8393
	(0.4647)	(0.5756)	(0.5183)
Not very serious | Somewhat serious	-0.6830	-2.1362	-1.3871
	(0.4374)	(0.4739)	(0.4715)
Somewhat serious | Very serious	0.8312	-0.3141	0.4828
	(0.4360)	(0.4350)	(0.4730)
Number of respondents	332	330	331
AIC	888	675	807

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.43: Ordered logistic regression models predicting perceived seriousness of environmental problems in the Switzerland among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.1859 (0.1705)	0.0859 (0.1868)	-0.1043 (0.1588)
Level of education	**0.1293** (0.0743)	-0.0517 (0.0885)	-0.1155 (0.0728)
Lower class	0.2897 (0.7313)	0.1165 (1.0739)	1.4882 (1.0990)
Working class	-0.2428 (0.4174)	-0.0404 (0.4582)	0.1034 (0.4628)
Upper class	-0.1243 (0.2507)	-0.0789 (0.2698)	0.0708 (0.2385)
Female	**0.4248** (0.2535)	0.3718 (0.2578)	0.3513 (0.2363)
Age younger than 30	0.3685 (0.5145)	0.3315 (0.4890)	0.1680 (0.4206)
Age 30-39	**0.7262** (0.3545)	0.2376 (0.3978)	-0.0186 (0.3173)
Age 50-59	0.2294 (0.3234)	0.5193 (0.3874)	0.0380 (0.3146)
Age 60-69	**0.6300** (0.3814)	-0.5317 (0.3746)	0.1530 (0.3639)
Age 70 and older	-0.1468 (0.4399)	0.1910 (0.4957)	0.4094 (0.5501)
Not serious at all | Not very serious			-5.4999 (1.0443)
Not very serious | Somewhat serious	-2.0281 (0.4566)	-3.8010 (0.5502)	-2.4199 (0.3903)
Somewhat serious | Very serious	0.4688 (0.3686)	-0.6397 (0.3667)	0.3623 (0.3441)
Number of respondents	381	381	380
AIC	645	527	705

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.44: Ordered logistic regression models predicting perceived seriousness of environmental problems in Switzerland among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	-0.0341	0.0039	-0.0925
(low; medium; high)	(0.1752)	(0.1819)	(0.1684)
Level of education	0.0818	-0.0541	-0.1736*
	(0.0891)	(0.0914)	(0.0881)
Lower class	--	--	--
Working class	-0.0600	-0.3410	0.4387
	(0.6072)	(0.5034)	(0.6179)
Upper class	**0.5742**	-0.1681	0.2942
	(0.2696)	(0.2959)	(0.2754)
Female	**0.7059**	-0.0618	**0.6846**
	(0.2572)	(0.2580)	(0.2640)
Age younger than 30	0.3424	-0.2526	0.6867
	(0.4805)	(0.5667)	(0.6792)
Age 30-39	0.6240	-0.1408	**0.7197**
	(0.4307)	(0.4716)	(0.4152)
Age 50-59	0.0525	0.1419	**0.6746**
	(0.3826)	(0.4053)	(0.3845)
Age 60-69	0.5282	-0.0877	0.2691
	(0.3926)	(0.3841)	(0.3904)
Age 70 and older	-0.3777	-0.0005	0.6182
	(0.4055)	(0.4006)	(0.4319)
Not serious at all | Not very serious	-2.3396		-2.8700
	(0.4648)		(0.5437)
Not very serious | Somewhat serious	-0.3077	-2.7156	-0.9658
	(0.3481)	(0.4468)	(0.4100)
Somewhat serious | Very serious	1.4623	-0.4493	1.4198
	(0.3572)	(0.3856)	(0.4121)
Number of respondents	289	291	290
AIC	725	574	677

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.45: Ordered logistic regression models predicting perceived seriousness of environmental problems in Canada among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	**0.9458**	**0.5265**	**0.6576**
(low; medium; high)	(0.2212)	(0.2548)	(0.2152)
Level of education	-0.1663	-0.0599	-0.0688
	(0.1067)	(0.1222)	(0.1045)
Lower class	-1.6411	-1.3043	0.9572
	(1.3614)	(0.9379)	(0.8273)
Working class	-0.4388	1.0186	0.1292
	(0.3617)	(0.6442)	(0.3758)
Upper class	0.2074	-0.0740	0.2737
	(0.3455)	(0.3995)	(0.3227)
Female	0.4102	0.4758	0.2784
	(0.2938)	(0.3549)	(0.2839)
Age younger than 30	-0.0238	0.3247	0.5826
	(0.3949)	(0.5058)	(0.4338)
Age 30-39	0.3625	0.8371	0.6100
	(0.4494)	(0.5303)	(0.4976)
Age 50-59	**1.4033**	-0.2840	0.1284
	(0.5094)	(0.5396)	(0.4275)
Age 60-69	0.5223	0.9273	-0.1597
	(0.5978)	(0.7180)	(0.5091)
Age 70 and older	-0.9550	0.4111	**-1.3946**
	(0.5855)	(0.7950)	(0.5330)
Not serious at all | Not very serious	-5.3339		-6.0138
	(0.7394)		(0.9931)
Not very serious | Somewhat serious	-3.5196	-5.6115	-3.6451
	(0.5154)	(0.9663)	(0.5124)
Somewhat serious | Very serious	-1.4058	-1.4864	-0.9309
	(0.4289)	(0.5306)	(0.4330)
Number of respondents	378	383	378
AIC	523	350	526

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.46: Ordered logistic regression models predicting perceived seriousness of environmental problems in Canada among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	-0.2141	0.1006	-0.1128
(low; medium; high)	(0.1729)	(0.1925)	(0.1823)
Level of education	-0.0465	-0.0981	0.1002
	(0.0769)	(0.0840)	(0.0775)
Lower class	**1.2911**	**1.2251**	0.5652
	(0.7281)	(0.7165)	(0.5744)
Working class	0.4672	0.1943	0.3184
	(0.3208)	(0.3866)	(0.3492)
Upper class	**0.7176**	-0.1321	-0.1508
	(0.3125)	(0.3228)	(0.2785)
Female	0.1842	0.2946	0.2737
	(0.2517)	(0.2985)	(0.2532)
Age younger than 30	0.2988	-0.0498	0.5929
	(0.4320)	(0.4840)	(0.4309)
Age 30-39	0.2292	0.2094	0.0379
	(0.4453)	(0.4313)	(0.3998)
Age 50-59	0.4384	0.6467	0.4841
	(0.3761)	(0.4632)	(0.3960)
Age 60-69	0.1294	0.4512	0.0947
	(0.4018)	(0.4847)	(0.4382)
Age 70 and older	**0.7718**	**1.0808**	**0.8126**
	(0.4298)	(0.4781)	(0.4489)
Not serious at all | Not very serious	-3.2633	-5.4267	-4.1127
	(0.5718)	(1.0519)	(0.7279)
Not very serious | Somewhat serious	-1.7126	-4.0516	-1.4660
	(0.3975)	(0.5815)	(0.4256)
Somewhat serious | Very serious	0.4370	-0.7735	0.4129
	(0.3881)	(0.4200)	(0.3854)
Number of respondents	409	425	423
AIC	853	598	904

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.47: Ordered logistic regression models predicting perceived seriousness of environmental problems in Norway among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.0348	0.0905	0.3809
	(0.2184)	(0.2673)	(0.2341)
Level of education	**0.1848**	**0.2850**	0.0535
	(0.0787)	(0.0912)	(0.0920)
Lower class	0.4355	0.7929	0.8998
	(0.7316)	(0.9408)	(0.9650)
Working class	-0.1909	-0.1172	-0.1566
	(0.3469)	(0.3988)	(0.3482)
Upper class	-0.4808	**-0.7570**	-0.1743
	(0.3118)	(0.3726)	(0.3325)
Female	0.2318	**0.5386**	0.2753
	(0.2720)	(0.3110)	(0.2814)
Age younger than 30	-0.1627	0.3702	0.1999
	(0.4531)	(0.4793)	(0.4883)
Age 30-39	-0.5240	-0.2529	-0.7163
	(0.4404)	(0.4842)	(0.4403)
Age 50-59	-0.3684	0.8071	-0.4981
	(0.4150)	(0.5066)	(0.4337)
Age 60-69	-0.7080	0.5946	-0.3837
	(0.4943)	(0.5752)	(0.5205)
Age 70 and older	0.3655	0.5076	-0.4898
	(0.6602)	(0.6773)	(0.7129)
Not serious at all | Not very serious	-4.2345	-4.8039	-5.7777
	(0.6699)	(1.0419)	(1.0864)
Not very serious | Somewhat serious	-3.2922	-2.8263	-3.4263
	(0.5510)	(0.5558)	(0.5186)
Somewhat serious | Very serious	-0.7415	-0.4174	-1.0926
	(0.4386)	(0.4729)	(0.4462)
Number of respondents	284	284	284
AIC	441.8809	342.2089	409.5932

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.48: Ordered logistic regression models predicting perceived seriousness of environmental problems in Norway among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	-0.0462	0.0730	-0.1061
(low; medium; high)	(0.2017)	(0.2166)	(0.2086)
Level of education	**0.2489**	0.0594	0.0876
	(0.0759)	(0.0725)	(0.0727)
Lower class	0.1142	-0.2255	-0.1665
	(0.6974)	(0.8916)	(0.7519)
Working class	0.0268	0.2025	-0.0597
	(0.3362)	(0.3680)	(0.3433)
Upper class	-0.2997	-0.2973	**-0.5031**
	(0.2423)	(0.2530)	(0.2415)
Female	0.3303	0.3238	0.0107
	(0.2281)	(0.2487)	(0.2281)
Age younger than 30	-0.0692	-0.0405	**0.8466**
	(0.3346)	(0.3704)	(0.3817)
Age 30-39	-0.3322	0.1026	0.1252
	(0.3278)	(0.3513)	(0.3271)
Age 50-59	-0.0325	-0.1057	-0.0506
	(0.3631)	(0.4038)	(0.3512)
Age 60-69	-0.1037	0.0076	0.4052
	(0.3773)	(0.3852)	(0.3540)
Age 70 and older	0.0310	0.7598	**1.2839**
	(0.4196)	(0.5071)	(0.4936)
Not serious at all | Not very serious	-3.5459	-5.6552	-4.8991
	(0.4979)	(1.0542)	(0.7352)
Not very serious | Somewhat serious	-1.7847	-3.3204	-2.2083
	(0.3639)	(0.4259)	(0.3710)
Somewhat serious | Very serious	0.2514	-0.4714	0.1115
	(0.3466)	(0.3345)	(0.3428)
Number of respondents	337	338	338
AIC	679.9312	526.0186	631.3425

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.49: Ordered logistic regression models predicting perceived seriousness of environmental problems in Germany among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.0386	**0.4165**	0.0939
	(0.1277)	(0.1387)	(0.1138)
Level of education	**0.1001**	0.0313	**0.0805**
	(0.0512)	(0.0537)	(0.0433)
Lower class	0.1275	0.3196	0.5748
	(0.6097)	(0.5297)	(0.5100)
Working class	-0.0468	0.0009	-0.0508
	(0.2208)	(0.2233)	(0.2253)
Upper class	0.2809	0.0591	-0.0606
	(0.2285)	(0.2238)	(0.2076)
Female	0.2505	**0.3110**	**0.3922**
	(0.1762)	(0.1865)	(0.1762)
Age younger than 30	-0.1535	0.4150	0.2257
	(0.3201)	(0.3329)	(0.3262)
Age 30-39	0.2520	0.3286	0.3165
	(0.2875)	(0.2807)	(0.2881)
Age 50-59	-0.3483	-0.4021	-0.3892
	(0.2980)	(0.3392)	(0.2431)
Age 60-69	0.1609	0.2944	0.1070
	(0.2764)	(0.2724)	(0.2514)
Age 70 and older	0.2426	-0.2665	-0.0418
	(0.3051)	(0.2749)	(0.2709)
Not serious at all | Not very serious	-5.1552	-4.7454	-5.4177
	(0.8069)	(0.7455)	(0.6664)
Not very serious | Somewhat serious	-2.2642	-1.8871	-1.7602
	(0.3113)	(0.3024)	(0.2433)
Somewhat serious | Very serious	0.1285	0.2811	0.4999
	(0.2549)	(0.2618)	(0.2309)
Number of respondents	686	690	684
AIC	1273	1370	1387

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.50: Ordered logistic regression models predicting perceived seriousness of environmental problems in Germany among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	**0.4317**	**0.5107**	0.0954
	(0.1927)	(0.2028)	(0.1893)
Level of education	0.0046	0.0870	0.1021
	(0.0752)	(0.0841)	(0.0829)
Lower class	-1.2211	-0.6647	-0.2287
	(0.9378)	(0.5121)	(0.5916)
Working class	0.1301	0.1337	-0.1874
	(0.3292)	(0.3308)	(0.3510)
Upper class	**0.7280**	0.2960	0.3872
	(0.3495)	(0.3188)	(0.3066)
Female	**0.6046**	**0.6072**	0.2950
	(0.2609)	(0.2710)	(0.2515)
Age younger than 30	-0.5169	-0.7293	-0.5814
	(0.4662)	(0.4495)	(0.4680)
Age 30-39	0.1258	-0.3269	-0.2100
	(0.4378)	(0.4547)	(0.4993)
Age 50-59	0.5745	0.3632	0.0205
	(0.4504)	(0.4680)	(0.4730)
Age 60-69	-0.3731	-0.4014	**-0.7696**
	(0.4420)	(0.4989)	(0.4580)
Age 70 and older	-0.1774	**-0.8642**	0.0564
	(0.4400)	(0.4412)	(0.4519)
Not serious at all | Not very serious	-4.0165	-5.7998	-4.2198
	(0.6147)	(1.0992)	(0.5784)
Not very serious | Somewhat serious	-1.5800	-1.6349	-1.2332
	(0.4114)	(0.4359)	(0.4475)
Somewhat serious | Very serious	0.6079	0.6476	0.7674
	(0.3792)	(0.3931)	(0.4242)
Number of respondents	285	284	284
AIC	597	592	652

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.51: Ordered logistic regression models predicting perceived seriousness of environmental problems in Australia among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	**0.4827**	0.4108	**0.4209**
	(0.2282)	(0.3170)	(0.2455)
Level of education	0.1322	**0.2678**	0.1919
	(0.1271)	(0.1480)	(0.1235)
Lower class	-0.2834	**13.6589**	-0.6864
	(1.1151)	(0.6421)	(1.7674)
Working class	0.0341	-0.1541	-0.2229
	(0.4707)	(0.5424)	(0.4314)
Upper class	0.3713	0.7371	0.0106
	(0.3748)	(0.5732)	(0.3990)
Female	0.1075	0.0766	0.3690
	(0.3052)	(0.4320)	(0.3175)
Age younger than 30	0.3326	-0.8354	0.2728
	(0.4891)	(0.6423)	(0.5562)
Age 30-39	0.2090	-0.5782	-0.1385
	(0.6019)	(0.7457)	(0.6197)
Age 50-59	0.1478	-0.2659	-0.3557
	(0.4315)	(0.6035)	(0.4140)
Age 60-69	0.3360	0.9723	0.7759
	(0.5180)	(0.9326)	(0.5966)
Age 70 and older	-0.2632	0.0848	-0.7616
	(0.5955)	(0.7217)	(0.5324)
Not serious at all | Not very serious	-4.1578	-4.9675	-4.4326
	(0.8419)	(1.0144)	(0.7010)
Not very serious | Somewhat serious	-2.6940	-3.5648	-2.8540
	(0.5273)	(0.6753)	(0.5477)
Somewhat serious | Very serious	-0.6662	-1.4760	-0.6540
	(0.5143)	(0.6498)	(0.4969)
Number of respondents	281	280	281
AIC	353	230	358

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.52: Ordered logistic regression models predicting perceived seriousness of environmental problems in Australia among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.0368	**0.4056**	0.2075
	(0.1844)	(0.1937)	(0.1838)
Level of education	**-0.1669**	-0.0856	**-0.1443**
	(0.0719)	(0.0860)	(0.0727)
Lower class	1.3051	0.1341	-0.0017
	(1.1716)	(0.8733)	(0.6380)
Working class	-0.1000	0.4023	-0.2296
	(0.3020)	(0.3695)	(0.3130)
Upper class	0.1912	**0.6201**	0.0394
	(0.2528)	(0.3247)	(0.2606)
Female	0.6973*	**0.5813**	**0.3858**
	(0.2316)	(0.2892)	(0.2326)
Age younger than 30	-0.6404	-0.0974	0.1438
	(0.4748)	(0.6714)	(0.6225)
Age 30-39	-0.0262	-0.1533	0.6420
	(0.4734)	(0.6485)	(0.5637)
Age 50-59	0.3340	0.2036	-0.1731
	(0.3962)	(0.5046)	(0.3910)
Age 60-69	-0.3190	-0.5657	**-0.9448**
	(0.3755)	(0.4764)	(0.3826)
Age 70 and older	-0.4982	-0.7777	**-0.9034**
	(0.3724)	(0.4731)	(0.3919)
Not serious at all | Not very serious	-3.6843		-6.4250
	(0.4705)		(1.1780)
Not very serious | Somewhat serious	-2.2176	-4.4246	-2.9644
	(0.4124)	(0.6228)	(0.4289)
Somewhat serious | Very serious	-0.4075	-1.1668	-0.9042
	(0.3920)	(0.5051)	(0.4013)
Number of respondents	343	342	341
AIC	693	416	637

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.53: Ordered logistic regression models predicting perceived seriousness of environmental problems in Sweden among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	**0.5121**	0.3220	**0.5121**
	(0.2039)	(0.2361)	(0.2022)
Level of education	0.0479	0.0116	**-0.2424**
	(0.0906)	(0.0849)	(0.0912)
Lower class	1.1557	**1.8870**	0.1638
	(0.7442)	(0.8964)	(0.6684)
Working class	-0.3798	-0.0602	-0.0599
	(0.3330)	(0.3657)	(0.3418)
Upper class	-0.2109	**0.7357**	-0.1667
	(0.3275)	(0.3830)	(0.3182)
Female	**0.7386**	**0.8708**	**0.5832**
	(0.2659)	(0.3085)	(0.2532)
Age younger than 30	-0.2190	**-0.9125**	-0.0715
	(0.4013)	(0.4370)	(0.3944)
Age 30-39	0.1274	-0.1399	0.6979
	(0.4379)	(0.5258)	(0.4505)
Age 50-59	-0.0278	0.0749	0.0133
	(0.4235)	(0.4695)	(0.3739)
Age 60-69	-0.2340	-0.5925	-0.5030
	(0.5289)	(0.5138)	(0.4637)
Age 70 and older	0.0946	-0.5189	**-1.2431**
	(0.6774)	(0.6522)	(0.5897)
Not serious at all | Not very serious		-5.6436	-6.3362
		(1.1106)	(1.1165)
Not very serious | Somewhat serious	-3.2303	-3.6883	-3.4663
	(0.5432)	(0.5088)	(0.5010)
Somewhat serious | Very serious	-0.6595	-1.1043*	-1.2728
	(0.4835)	(0.4797)	(0.4477)
Number of respondents	324	332	331
AIC	456	384	507

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.54: Ordered logistic regression models predicting perceived seriousness of environmental problems in Sweden among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	-0.1162	-0.2022	-0.0171
	(0.1691)	(0.1761)	(0.1702)
Level of education	0.0487	0.0943	0.0720
	(0.0771)	(0.0937)	(0.0799)
Lower class	-0.1436	1.4299	**1.3909**
	(0.7526)	(1.0416)	(0.8298)
Working class	0.4169	**1.2350**	0.5547
	(0.5353)	(0.6960)	(0.5065)
Upper class	0.0178	0.0253	0.0588
	(0.2242)	(0.2523)	(0.2283)
Female	**0.4059**	**0.9116**	**0.6279**
	(0.2232)	(0.2501)	(0.2142)
Age younger than 30	-0.3281	-0.1266	0.3140
	(0.3776)	(0.4100)	(0.3479)
Age 30-39	-0.2492	-0.3675	-0.3751
	(0.3870)	(0.3771)	(0.3629)
Age 50-59	0.0285	-0.0195	0.0237
	(0.3781)	(0.4005)	(0.3263)
Age 60-69	-0.3638	-0.1152	-0.0003
	(0.3789)	(0.4042)	(0.3446)
Age 70 and older	0.2351	0.3939	0.1429
	(0.4615)	(0.4959)	(0.4236)
Not serious at all | Not very serious	-4.6685		-4.7713
	(0.7476)		(0.7750)
Not very serious | Somewhat serious	-2.6694	-3.7905	-1.6940
	(0.4449)	(0.5863)	(0.3692)
Somewhat serious | Very serious	-0.1044	-0.1231	0.4990
	(0.3769)	(0.4279)	(0.3518)
Number of respondents	376	379	377
AIC	668	508	735

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.55: Ordered logistic regression models predicting perceived seriousness of environmental problems in Japan among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.3983 (0.2650)	**0.4265** (0.2428)	0.2978 (0.2537)
Level of education	0.0262 (0.1542)	-0.0440 (0.1302)	0.0712 (0.1452)
Lower class	-0.3526 (0.6433)	-0.3456 (0.5312)	-0.6211 (0.6826)
Working class	0.2194 (0.4247)	**0.6650** (0.3951)	0.3718 (0.3701)
Upper class	-0.0092 (0.5307)	0.0383 (0.4175)	0.1126 (0.4135)
Female	**1.1559** (0.3965)	**1.0356** (0.3302)	**0.8747** (0.3237)
Age younger than 30	**0.8618** (0.5087)	**1.1596** (0.4418)	0.2947 (0.4361)
Age 30-39	**2.0291** (0.9396)	**1.2885** (0.6326)	0.4388 (0.5570)
Age 50-59	**1.1635** (0.5807)	0.3900 (0.4863)	0.0951 (0.4157)
Age 60-69	0.7456 (0.5639)	**0.8792** (0.4722)	**0.9244** (0.4520)
Age 70 and older	-0.0605 (0.6324)	0.2975 (0.6103)	0.3107 (0.6024)
Not serious at all | Not very serious			-3.3455 (0.7917)
Not very serious | Somewhat serious	-3.0591 (0.7992)	-2.4612 (0.6443)	-2.0758 (0.6400)
Somewhat serious | Very serious	0.0395 (0.6251)	0.8064 (0.5584)	0.8938 (0.5906)
Number of respondents	195	193	193
AIC	238	305	355

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Table A4.56: Ordered logistic regression models predicting perceived seriousness of environmental problems in Japan among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	0.0108	0.1536	-0.0057
(low; medium; high)	(0.2418)	(0.2312)	(0.2331)
Level of education	0.0545	-0.0050	0.0335
	(0.1140)	(0.1189)	(0.1273)
Lower class	1.0954	**1.5502**	**1.4940**
	(0.7930)	(0.7980)	(0.6706)
Working class	0.1833	0.4606	0.0751
	(0.3742)	(0.3587)	(0.3509)
Upper class	0.3985	-0.0026	-0.1558
	(0.5353)	(0.4125)	(0.4543)
Female	0.4859	**0.6295**	-0.0372
	(0.3212)	(0.3074)	(0.3025)
Age younger than 30	0.1154	-0.3389	**1.0381**
	(0.6887)	(0.5530)	(0.5977)
Age 30-39	-0.0512	-0.2108	-0.1381
	(0.6231)	(0.5552)	(0.4914)
Age 50-59	-0.1326	0.3495	0.3896
	(0.5419)	(0.5124)	(0.4420)
Age 60-69	-0.6243	-0.5891	-0.8047
	(0.5675)	(0.5134)	(0.4934)
Age 70 and older	-0.4583	-0.6786	-0.2065
	(0.5934)	(0.5510)	(0.5382)
Not very serious | Somewhat serious	-3.7086	-3.5586	-2.4071
	(0.6468)	(0.7117)	(0.5803)
Somewhat serious | Very serious	-0.5585	-0.0865	0.4380
	(0.5664)	(0.5525)	(0.5743)
Number of respondents	199	200	195
AIC	294	322	368

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.57: Ordered logistic regression models predicting perceived seriousness of environmental problems in Turkey among those on the left (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest	-0.2857	0.1521	0.1815
(low; medium; high)	(0.3289)	(0.2953)	(0.2804)
Level of education	**0.2071**	0.1432	**0.1368**
	(0.0893)	(0.0906)	(0.0786)
Lower class	-0.1282	-0.8227	-0.1794
	(0.8956)	(0.7555)	(0.6186)
Working class	0.8216	0.2610	0.2746
	(0.5941)	(0.5843)	(0.4568)
Upper class	0.0687	-0.1014	0.0269
	(0.5198)	(0.4930)	(0.4340)
Female	0.1863	0.0118	-0.4123
	(0.4756)	(0.4306)	(0.3826)
Age younger than 30	**-2.5140**	**-0.9927**	**-0.9513**
	(1.1047)	(0.5846)	(0.5003)
Age 30-39	-1.4871	-0.9650	-0.8677
	(1.2707)	(0.7180)	(0.6181)
Age 50-59	-2.0200*	0.2281	**-1.1309**
	(1.2145)	(0.8830)	(0.6466)
Age 60-69	-1.8471	-1.0960	-0.6654
	(1.6311)	(1.6197)	(1.5332)
Age 70 and older	**12.0359**	**13.0971**	**12.6362**
	(1.0383)	(0.7370)	(0.6075)
Not serious at all | Not very serious	-6.5834	-5.3089	-5.5876
	(1.2845)	(1.0352)	(0.9534)
Not very serious | Somewhat serious	-5.0873	-4.9959	-4.4517
	(1.1534)	(0.9592)	(0.6862)
Somewhat serious | Very serious	-3.6028	-2.6728	-2.5056
	(1.0842)	(0.7039)	(0.5513)
Number of respondents	276	281	280
AIC	218	244	312

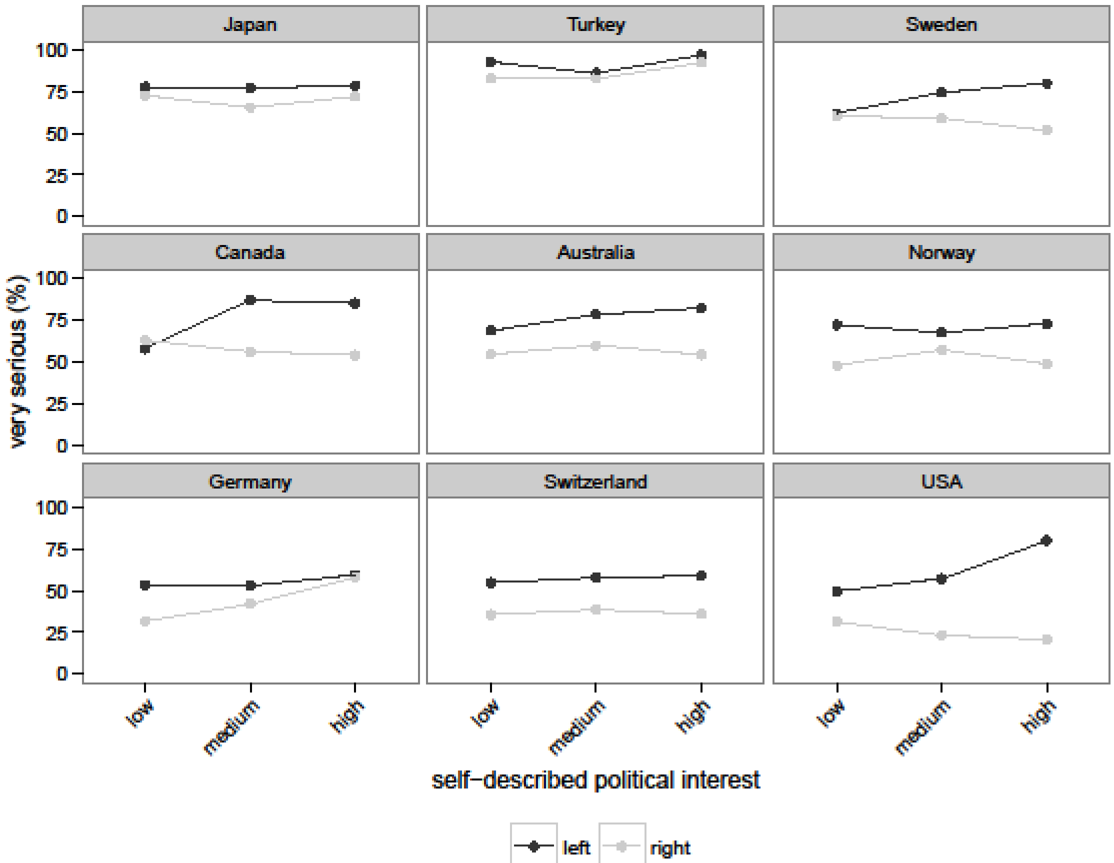
Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Left was defined as respondents who chose 1, 2, 3, or 4 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, “Now let’s consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?”

Table A4.58: Ordered logistic regression models predicting perceived seriousness of environmental problems in Turkey among those on the right (World Values Survey 2005-2009)

	Global warming or the greenhouse effect	Pollution of rivers, lakes, and oceans	Loss of plant or animal species or biodiversity
Political interest (low; medium; high)	0.2897	-0.0537	0.1154
	(0.1997)	(0.1816)	(0.1867)
Level of education	0.1103	**0.1535**	0.0773
	(0.0765)	(0.0761)	(0.0652)
Lower class	0.8549	0.6248	0.1781
	(0.7152)	(0.5963)	(0.5642)
Working class	0.4947	**1.0017**	**0.6469**
	(0.3560)	(0.3905)	(0.3382)
Upper class	0.2077	0.5312	0.3367
	(0.3150)	(0.3275)	(0.2854)
Female	0.3127	-0.1944	**-0.4659**
	(0.2929)	(0.2867)	(0.2635)
Age younger than 30	-0.1828	-0.0454	-0.3466
	(0.3417)	(0.3678)	(0.3220)
Age 30-39	0.3444	0.1859	-0.1183
	(0.4259)	(0.4215)	(0.3817)
Age 50-59	-0.1532	0.4445	-0.0685
	(0.4308)	(0.5121)	(0.4549)
Age 60-69	0.8498	0.0978	-0.1681
	(0.6802)	(0.5379)	(0.5760)
Age 70 and older	0.4401	0.2021	-0.6058
	(0.7413)	(0.7951)	(0.6520)
Not serious at all | Not very serious	-4.3290	-5.9357	-4.7076
	(0.5132)	(1.0269)	(0.5244)
Not very serious | Somewhat serious	-2.7780	-3.4880	-3.1669
	(0.3640)	(0.3993)	(0.3279)
Somewhat serious | Very serious	-1.4167	-1.3769	-1.5838
	(0.3389)	(0.3438)	(0.3155)
Number of respondents	455	465	461
AIC	544.0863	485.8105	630.5880

Standard errors in parentheses. $p < 0.10$ in **bold.** Listwise deletion and weighted. Right was defined as respondents who chose 7, 8, 9, or 10 to describe their political ideology on the left-right continuum from 1 to 10. Respondents were asked, "Now let's consider environmental problems in the world as a whole. Please, tell me how serious you consider each of the following to be for the world as a whole. Is it very serious, somewhat serious, not very serious or not serious at all?"

Figure A4.1: Percentage of respondents to say climate change is very serious by political ideology and interest in politics, by OECD country (World Values Survey 2005-2009)



Notes: Column percentages are reported in the graph. Left are considered those from one to four on the political ideology left-right continuum, while right are from seven to 10. Political interest has been collapsed into three different categories: low, medium, and high. Low captures "not at all interested" and "not very interested" categories, medium captures the "somewhat interested" captures, and high captures the "very interested" category. Political interest was collapsed this way in order to overcome small sample sizes in each cell and also show patterns across countries. I only include countries which had at least 25 respondents in each cell, so only 9 countries were included and eight OECD countries were dropped.

Appendix E: Additional models, analysis and robustness checks for Chapter 7

Table A5.1: Random-intercept multilevel linear models predicting perceived dangerousness of environmental problems (International Social Science Survey 2009-2011)

	Pollution from cars	Pollution from industry	Pollution of rivers, lakes, and streams	Pesticides and chemicals in farming	Genetically modified crops	Nuclear power plants
Dangerousness of climate change	**0.0850**	**0.0805**	**0.0921**	**0.0806**	**0.0957**	**0.0824**
	(0.0022)	(0.0026)	(0.0041)	(0.0028)	(0.0046)	(0.0036)
Level of education	0.0008	0.0004	**0.0032**	**0.0056**	-0.0032	**-0.0183**
	(0.0015)	(0.0011)	(0.0016)	(0.0012)	(0.0020)	(0.0030)
Female	**0.0175**	**0.0126**	**0.0115**	**0.0200**	**0.0429**	**0.0698**
	(0.0027)	(0.0029)	(0.0031)	(0.0040)	(0.0057)	(0.0088)
Age under 30	-0.0002	**0.0111**	-0.0050	-0.0370*	**-0.0484**	0.0042
	(0.0042)	(0.0037)	(0.0043)	(0.0051)	(0.0075)	(0.0063)
Age 30-39	0.0007	**0.0088**	-0.0037	**-0.0117**	**-0.0163**	0.0037
	(0.0040)	(0.0044)	(0.0036)	(0.0043)	(0.0056)	(0.0069)
Age 50-59	-0.0032	**-0.0089**	-0.0064	0.0048	0.0013	-0.0108
	(0.0046)	(0.0030)	(0.0045)	(0.0029)	(0.0053)	(0.0056)
Age 60-69	0.0061	**-0.0127**	0.0004	0.0068	-0.0019	**-0.0309**
	(0.0045)	(0.0037)	(0.0055)	(0.0043)	(0.0067)	(0.0061)
Age 70 and older	**0.0183**	**-0.0176**	-0.0067	0.0013	-0.0055	**-0.0299**
	(0.0052)	(0.0046)	(0.0060)	(0.0045)	(0.0074)	(0.0085)
Constant	0.4135	0.5232	0.4613	0.4725	0.3686	0.4921
	(0.0129)	(0.0118)	(0.0131)	(0.0131)	(0.0164)	(0.0193)
Variance components						
Country-level standard Deviation	**0.0542**	**0.0399**	**0.0553**	**0.0534**	**0.0761**	**0.0905**
	(0.0055)	(0.0041)	(0.0065)	(0.0063)	(0.0072)	(0.0083)
Individual-level standard deviation	**0.1893**	**0.1795**	**0.1991**	**0.2016**	**0.2328**	**0.2437**
	(0.0036)	(0.0029)	(0.0046)	(0.0043)	(0.0046)	(0.0051)
Number of respondents	41806	41912	41812	41596	38990	40751
Number of countries	32	32	32	32	32	32
AIC	-14086	-17203	-11155	-10379	-1957	540

Table A5.1 (cont'd)

Notes: Linear regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion used for missing values. The dependent variable, perceived dangerous of each environmental problem, ranges from 0 to 1: 0=not dangerous at all; 0.25=somewhat dangerous; 0.75=very dangerous; 1=extremely dangerous

Table A5.2: Linear models predicting perceived dangerousness of environmental problems, United States (International Social Science Survey 2009-2011)

	(1) Pollution from cars	(2) Pollution from industry	(3) Pollution of rivers, lakes, and streams	(4) Pesticides and chemicals in farming	(5) Genetically modified crops	(6) Nuclear power stations
Dangerousness of climate change	**0.0955**	**0.0862**	**0.0777**	**0.0664**	**0.0674**	**0.0797**
	(0.0053)	(0.0051)	(0.0058)	(0.0063)	(0.0079)	(0.0071)
Level of education	**-0.0186**	-0.0074	0.0069	**-0.0126**	-0.0143	**-0.0554**
	(0.0052)	(0.0054)	(0.0062)	(0.0059)	(0.0073)	(0.0074)
Female	0.0147	**0.0304**	0.0165	**0.0459**	**0.0732**	**0.1278**
	(0.0118)	(0.0122)	(0.0128)	(0.0131)	(0.0165)	(0.0163)
Age under 30	-0.0008	-0.0149	0.0109	**-0.0505**	-0.0112	**0.0678**
	(0.0192)	(0.0193)	(0.0217)	(0.0208)	(0.0257)	(0.0244)
Age 30-39	-0.0263	-0.0129	0.0016	-0.0239	-0.0144	0.0397
	(0.0179)	(0.0191)	(0.0194)	(0.0207)	(0.0288)	(0.0265)
Age 50-59	0.0164	0.0294	0.0125	0.0247	0.0031	0.0218
	(0.0206)	(0.0195)	(0.0192)	(0.0205)	(0.0273)	(0.0265)
Age 60-69	**0.0396**	0.0259	0.0344	0.0316	**-0.0565**	**-0.0622**
	(0.0191)	(0.0195)	(0.0221)	(0.0208)	(0.0280)	(0.0273)
Age 70 and older	-0.0257	**-0.0540**	-0.0263	-0.0272	-0.0605	-0.0461
	(0.0217)	(0.0222)	(0.0254)	(0.0257)	(0.0315)	(0.0324)
Constant	0.3986	0.4991	0.5293	0.5268*	0.3805	0.5425
	(0.0200)	(0.0187)	(0.0217)	(0.0309)	(0.0382)	(0.0380)
Number of respondents	1304	1309	1305	1296	1134	1262
R^2	0.2727	0.2474	0.1786	0.1530	0.1338	0.2530
adjusted R^2	0.2682	0.2428	0.1735	0.1478	0.1276	0.2483

Notes: Linear regression coefficients with standard error in parentheses. Coefficients estimates that can be distinguished from zero at the conventional level statistical significance (two-tailed $p < 0.05$) are in **bold**. Listwise deletion used for missing values.

Table A5.3: Correlations with perceived dangerousness of climate change across countries (International Social Survey Programme 2009-2011)

Item	Argentina	Austria	Belgium	Bulgaria	Canada	Chile	Taiwan	Croatia	Czech Republic
Air pollution from cars	0.367	0.348	0.442	0.385	0.447	0.396	0.254	0.442	0.380
Air pollution from industry	0.419	0.299	0.374	0.402	0.472	0.501	0.379	0.460	0.415
Pollution of rivers, lakes, and streams	0.451	0.343	0.418	0.361	0.428	0.578	0.427	0.580	0.440
Pesticides and chemicals used in farming	0.377	0.345	0.384	0.382	0.343	0.423	0.345	0.472	0.384
Modifying the genes of certain crops	0.393	0.320	0.364	0.375	0.332	0.458	0.295	0.561	0.402
Nuclear power stations	0.419	0.211	0.316	0.292	0.187	0.500	0.173	0.397	0.287

Table A5.3 (cont'd)

Item	Denmark	Finland	France	Germany	Israel	Japan	South Korea	Latvia	Lithuania
Air pollution from cars	0.408	0.489	0.440	0.343	0.282	0.403	0.355	0.430	0.353
Air pollution from industry	0.376	0.378	0.339	0.354	0.251	0.432	0.407	0.401	0.359
Pollution of rivers, lakes, and streams	0.346	0.315	0.356	0.310	0.316	0.426	0.404	0.436	0.475
Pesticides and chemicals used in farming	0.349	0.347	0.302	0.289	0.245	0.338	0.336	0.403	0.353
Modifying the genes of certain crops	0.244	0.292	0.340	0.308	0.313	0.394	0.411	0.456	0.382
Nuclear power stations	0.196	0.328	0.294	0.291	0.163	0.277	0.253	0.367	0.380

Table A5.3 (cont'd)

Item	Mexico	New Zealand	Norway	Philippines	Russia	Slovak Republic	Slovenia	South Africa	Spain
Air pollution from cars	0.299	0.473	0.466	0.370	0.393	0.408	0.304	0.365	0.390
Air pollution from industry	0.439	0.480	0.434	0.389	0.385	0.396	0.316	0.410	0.398
Pollution of rivers, lakes, and streams	0.470	0.365	0.321	0.337	0.394	0.523	0.405	0.539	0.380
Pesticides and chemicals used in farming	0.282	0.360	0.342	0.317	0.392	0.460	0.323	0.416	0.339
Modifying the genes of certain crops	0.389	0.301	0.263	0.456	0.438	0.505	0.373	0.466	0.323
Nuclear power stations	0.421	0.344	0.307	0.395	0.386	0.259	0.363	0.385	0.310

Table A5.3 (cont'd)

Item	Sweden	Switzerland	Turkey	Great Britain	United States	**All Countries**
Air pollution from cars	0.491	0.334	0.492	0.537	0.487	0.429
Air pollution from industry	0.421	0.309	0.449	0.520	0.485	0.427
Pollution of rivers, lakes, and streams	0.365	0.252	0.579	0.364	0.396	0.426
Pesticides and chemicals used in farming	0.368	0.267	0.522	0.379	0.350	0.376
Modifying the genes of certain crops	0.231	0.302	0.566	0.259	0.310	0.390
Nuclear power stations	0.222	0.258	0.432	0.325	0.369	0.341

Table A5.4: Exploratory factor analysis with promax rotation of perceived dangerousness of environmental problems (International Social Science Programme 2009-2011)

Country	Argentina		Austria		Belgium		Bulgaria		Canada		Chile	
Factor	1	2	1	2	1	2	1	2	1	2	1	2
Climate Change	0.63	-	0.40	0.19	0.63	-	0.61	-	0.54	0.09	0.55	0.21
Air pollution from cars	0.58	-	0.82	-0.24	0.65	-	0.60	-	0.80	-0.08	-0.07	0.72
Air pollution from industry	0.71	-	0.75	-0.13	0.66	-	0.66	-	0.75	0.05	0.02	0.75
Pollution of rivers, lakes, and streams	0.70	-	0.40	0.32	0.66	-	0.61	-	0.41	0.30	0.48	0.24
Pesticides and chemicals used in farming	0.66	-	0.40	0.20	0.67	-	0.68	-	0.27	0.50	0.33	0.37
Modifying the genes of certain crops	0.57	-	-0.23	0.96	0.49	-	0.62	-	-0.09	0.72	0.66	0.00
Nuclear power stations	0.59	-	0.03	0.46	0.46	-	0.38	-	-0.09	0.58	0.83	-0.10
Variance Explained	2.58		2.084	1.883	2.59		2.51		2.58	2.31	2.96	2.80
Correlation with Factor 1		-		0.67		-				0.71		0.79

Table A5.4 (cont'd)

Country	Taiwan		Croatia		Czech Republic		Denmark		Finland	
Factor	1	2	1	2	1	2	1	2	1	2
Climate Change	0.73	-	0.85	-0.10	0.63	-	0.18	0.38	0.59	-
Air pollution from cars	0.63	-	0.18	0.50	0.62	-	-0.11	0.87	0.68	-
Air pollution from industry	0.72	-	-0.15	1.07	0.71	-	0.09	0.67	0.72	-
Pollution of rivers, lakes, and streams	0.69	-	0.67	0.04	0.64	-	0.74	-0.04	0.58	-
Pesticides and chemicals used in farming	0.71	-	0.56	0.16	0.66	-	0.82	-0.01	0.67	-
Modifying the genes of certain crops	0.66	-	0.84	-0.17	0.56	-	0.55	-0.06	0.45	-
Nuclear power stations	0.57	-	0.39	0.22	0.39	-	0.30	0.12	0.45	-
Variance Explained	3.18		2.08	3.11	2.60		2.37	2.30	2.51	
Correlation with Factor 1		-		0.75		-		0.71		-

Table A5.4 (cont'd)

Country	France		Germany		Israel		Japan		South Korea	
Factor	1	2	1	2	1	2	1	2	1	2
Climate Change	0.56	-	0.53	-	0.48	-	0.29	0.36	0.17	0.45
Air pollution from cars	0.54	-	0.57	-	0.52	-	0.79	-0.04	0.83	-0.10
Air pollution from industry	0.66	-	0.66	-	0.62	-	0.90	-0.12	0.87	-0.05
Pollution of rivers, lakes, and streams	0.65	-	0.63	-	0.55	-	0.32	0.39	0.27	0.40
Pesticides and chemicals used in farming	0.69	-	0.63	-	0.65	-	0.30	0.44	0.43	0.32
Modifying the genes of certain crops	0.55	-	0.54	-	0.55	-	-0.25	0.80	-0.14	0.81
Nuclear power stations	0.47	-	0.48	-	0.28	-	-0.05	0.57	-0.14	0.61
Variance Explained	2.47		2.36		1.99		2.47	2.31	2.52	2.38
Correlation with Factor 1		-		-		-		0.70		0.71

Table A5.4 (cont'd)

Country	Latvia		Lithuania		Mexico		New Zealand		Norway	
Factor	1	2	1	2	1	2	1	2	1	2
Climate Change	0.61	-	0.59	-	0.63	-	0.50	0.14	0.62	-
Air pollution from cars	0.72	-	0.62	-	0.50	-	0.85	-0.11	0.69	-
Air pollution from industry	0.70	-	0.71	-	0.71	-	0.88	-0.08	0.72	-
Pollution of rivers, lakes, and streams	0.69	-	0.68	-	0.67	-	0.28	0.32	0.56	-
Pesticides and chemicals used in farming	0.75	-	0.70	-	0.62	-	0.30	0.41	0.60	-
Modifying the genes of certain crops	0.59	-	0.57	-	0.55	-	-0.18	0.83	0.46	-
Nuclear power stations	0.50	-	0.49	-	0.55	-	-0.06	0.68	0.43	-
Variance Explained	3.03		2.75		2.60		2.64	2.42	2.45	
Correlation with Factor 1		-		-		-		0.73		-

Table A5.4 (cont'd)

Country	Philippines		Russia		Slovak Republic		Slovenia		South Africa	
Factor	1	2	1	2	1	2	1	2	1	2
Climate Change	0.65	-	-0.06	0.68	0.12	0.61	0.60	-	0.70	-
Air pollution from cars	0.59	-	0.60	0.13	0.72	0.01	0.61	-	0.56	-
Air pollution from industry	0.63	-	0.93	-0.06	0.96	-0.19	0.69	-	0.59	-
Pollution of rivers, lakes, and streams	0.58	-	0.40	0.36	0.22	0.54	0.62	-	0.69	-
Pesticides and chemicals used in farming	0.54	-	0.43	0.38	0.41	0.36	0.65	-	0.69	-
Modifying the genes of certain crops	0.58	-	-0.05	0.73	-0.28	0.94	0.46	-	0.54	-
Nuclear power stations	0.55	-	-0.11	0.62	0.02	0.40	0.41	-	0.53	-
Variance Explained	2.44		2.85	2.81	2.60	2.54	2.41		2.78	
Correlation with Factor 1		-		0.75		0.70		-		-

Table A5.4 (cont'd)

Country	Spain		Sweden		Switzerland		Turkey		Great Britain	
Factor	1	2	1	2	1	2	1	2	1	2
Climate Change	0.60	-	0.59	-	0.19	0.33	0.71	-	0.68	-0.03
Air pollution from cars	0.61	-	0.71	-	0.72	-0.05	0.67	-	0.88	-0.12
Air pollution from industry	0.69	-	0.74	-	0.88	-0.10	0.73	-	0.90	-0.13
Pollution of rivers, lakes, and streams	0.62	-	0.65	-	0.18	0.18	0.76	-	0.34	0.21
Pesticides and chemicals used in farming	0.65	-	0.67	-	0.21	0.51	0.76	-	0.33	0.39
Modifying the genes of certain crops	0.46	-	0.41	-	-0.22	0.81	0.77	-	-0.26	0.97
Nuclear power stations	0.41	-	0.44	-	-0.05	0.53	0.62	-	-0.29	0.28
Variance Explained	2.41		2.64		2.06	2.05	3.61		2.73	2.13
Correlation with Factor 1		-		-		0.69		-		0.70

Table A5.4 (cont'd)

Country	United States	
Factor	1	2
Climate Change	0.41	0.24
Air pollution from cars	0.93	-0.16
Air pollution from industry	0.81	0.03
Pollution of rivers, lakes, and streams	0.35	0.32
Pesticides and chemicals used in farming	0.37	0.34
Modifying the genes of certain crops	-0.22	0.81
Nuclear power stations	-0.03	0.61
Variance Explained	2.80	2.51
Correlation with Factor 1		0.76

Table A5.5: Logistic regression models predicting considering the environment most important or next most important issue, by country (International Social Survey Programme 2009-2011)

	Argentina	Austria	Belgium	Bulgaria	Canada	Chile
Dangerousness	**0.5307**	0.0302	**0.5336**	-0.0251	**0.5804**	-0.3742
of climate change	(0.2468)	(0.0949)	(0.0837)	(0.1726)	(0.1220)	(0.2940)
Left party identification	-0.4336	-0.0696	0.3155	0.4768	0.1679	-0.2102
	(0.6319)	(0.2338)	(0.2887)	(0.3407)	(0.2470)	(0.5357)
Right party identification	--	-0.1704	-0.1599	0.5658	-0.5714	-0.6858
		(0.2385)	(0.2901)	(0.6006)	(0.3235)	(0.4952)
Level of education	-0.0001	0.0279	0.0446	0.1315	0.0413	**0.3425**
	(0.1755)	(0.0832)	(0.0714)	(0.1270)	(0.0823)	(0.1697)
Female	-0.2706	0.0162	-0.0967	-0.2145	-0.1591	0.1182
	(0.3837)	(0.1948)	(0.1590)	(0.3070)	(0.2104)	(0.3587)
Age under 30	0.9336	0.2867	-0.2321	**1.8347**	-0.4210	-0.5218
	(0.6779)	(0.2706)	(0.2698)	(0.6824)	(0.3625)	(0.5322)
Age 30-39	0.4141	0.0301	0.0493	0.9529	-0.2605	-0.4212
	(0.7460)	(0.3167)	(0.2667)	(0.7067)	(0.4095)	(0.4756)
Age 50-59	0.9885	-0.6265	0.3509	**1.3053**	-0.0204	-0.7236
	(0.6812)	(0.3337)	(0.2436)	(0.6653)	(0.3119)	(0.5637)
Age 60-69	0.3323	-0.1630	0.3109	0.9753	0.1172	-0.6220
	(0.8420)	(0.3447)	(0.2709)	(0.7043)	(0.3257)	(0.6316)
Age 70 and older	-0.0550	-0.1981	0.3550	1.0365	0.2114	**-2.5969**
Constant	-5.5512	-1.6626	-2.6280	-4.1518	-2.3947	-1.5339
	(1.1355)	(0.3716)	(0.3876)	(0.8397)	(0.5202)	(1.0833)
Number of respondents	1066	958	1010	932	868	1371
AIC	298	837	1059	424	984	422

Table A5.5 (cont'd)

	Croatia	Czech Republic	Denmark	Finland	France	Germany
Dangerousness	0.0011	**0.2257**	**0.2389**	**0.4866**	**0.3638**	**0.1665**
of climate change	(0.1237)	(0.0905)	(0.0677)	(0.0713)	(0.0913)	(0.0798)
Left party identification	**0.7431**	-0.1232	-0.1228	**-0.3546**	0.2644	0.2251
	(0.3536)	(0.1943)	(0.1699)	(0.1790)	(0.2012)	(0.1622)
Right party identification	0.4713	0.0879	**-0.5937**	**-0.4219**	-0.4109	-0.2814
	(0.4189)	(0.2044)	(0.1702)	(0.2004)	(0.2323)	(0.2198)
Level of education	0.0260	0.0809	0.0606	0.0800	0.0301	-0.0071
	(0.1013)	(0.0794)	(0.0771)	(0.0663)	(0.0640)	(0.0534)
Female	0.3313	-0.2429	**0.3028**	0.1837	0.3191	0.0914
	(0.2355)	(0.1625)	(0.1374)	(0.1540)	(0.1762)	(0.1468)
Age under 30	0.0900	0.5605*	-0.0852	0.2045	0.5832	-0.1446
	(0.3593)	(0.2556)	(0.2365)	(0.2448)	(0.3130)	(0.2443)
Age 30-39	-0.1568	0.1475	-0.4542	0.2745	0.0950	-0.0199
	(0.3802)	(0.2783)	(0.2397)	(0.2569)	(0.2445)	(0.2643)
Age 50-59	-0.0797	0.2717	**0.4025**	0.0132	-0.1863	0.0482
	(0.3729)	(0.2731)	(0.2047)	(0.2490)	(0.2062)	(0.2398)
Age 60-69	0.2827	0.2473	0.1239	-0.0880	-0.0388	0.0887
	(0.3762)	(0.2867)	(0.2245)	(0.2603)	(0.1913)	(0.2430)
Age 70 and older	-0.4523	0.1399	0.1466	0.0280	-0.3110	0.1822
	(0.5842)	(0.3360)	(0.2600)	(0.4048)	(0.2159)	(0.2448)
Constant	-2.8483	-2.3595	-1.4846	-2.4583	-2.4519	-2.0771
	(0.4459)	(0.3182)	(0.2755)	(0.2968)	(0.3125)	(0.3176)
Number of respondents	1155	1299	1115	1092	1872	1222
AIC	609	1130	1329	1170	1923	1191

Table A5.5 (cont'd)

	Japan	South Korea	Latvia	Lithuania	Mexico	New Zealand
Dangerousness of climate change	**0.2777** (0.1016)	0.0764 (0.0720)	0.1525 (0.1475)	0.1784 (0.3204)	**0.2682** (0.0930)	**0.4515** (0.0783)
Left party identification	0.3553 (0.2071)	-0.0875 (0.2229)	-0.0103 (0.3864)	-1.0766 (0.7786)	-0.0677 (0.1789)	**-0.7208** (0.2119)
Right party identification	0.2598 (0.2165)	-0.2457 (0.2364)	-0.3711 (1.0562)	0.8340 (0.8748)	0.2492 (0.2371)	**-0.8539** (0.1895)
Level of education	**-0.1297** (0.0644)	0.0905 (0.0587)	-0.1874 (0.1454)	0.0453 (0.1766)	-0.1118 (0.0599)	**0.1653** (0.0619)
Female	0.1763 (0.1661)	-0.1851 (0.1255)	0.3827 (0.3372)	0.5907 (0.6010)	0.0073 (0.1637)	**-0.3615** (0.1698)
Age under 30	0.4592 (0.2840)	0.0163 (0.1921)	-0.5007 (0.5385)	0.2380 (0.6695)	0.0529 (0.2363)	0.4285 (0.2979)
Age 30-39	-0.0289 (0.2953)	-0.1233 (0.1859)	0.2042 (0.5400)	0.0654 (0.7608)	-0.2130 (0.2658)	0.3964 (0.2935)
Age 50-59	-0.1449 (0.2931)	**0.5375** (0.2043)	0.3367 (0.4997)	-1.6875 (1.0856)	0.3390 (0.2625)	0.4656 (0.2818)
Age 60-69	-0.1491 (0.2876)	0.3635 (0.2441)	-0.0277 (0.5858)	-0.6667 (0.8735)	-0.2669 (0.3516)	**0.6774** (0.2848)
Age 70 and older	-0.0548 (0.3048)	0.0360 (0.2780)	-0.5129 (0.7110)	-0.7700 (0.8034)	-0.7122 (0.3975)	0.3857 (0.3139)
Constant	-2.8184 (0.4153)	-1.3576 (0.3217)	-3.5460 (0.5966)	-4.3560 (0.9681)	-2.8237 (0.3812)	-2.2271 (0.3282)
Number of respondents	1185	1504	902	935	1419	1030
AIC	1027	1619	354	221	1090	1027

Table A5.5 (cont'd)

	Norway	Philippines	Russia	Slovak Republic	Slovenia	South Africa
Dangerousness	**0.3294**	0.0329	0.0107	0.1310	-0.1271	-0.1165
of climate change	(0.0673)	(0.1450)	(0.1002)	(0.1362)	(0.1232)	(0.0986)
Left party identification	**0.5450**	-0.0376	0.2062	0.2396	-0.0625	-0.3320
	(0.1857)	(0.4519)	(0.1976)	(0.2708)	(0.2864)	(0.2272)
Right party identification	**-0.5528**	0.1851	-0.6655	0.0312	0.0490	0.0524
	(0.2273)	(0.4586)	(0.5726)	(0.6258)	(0.2731)	(0.6430)
Level of education	0.0989	0.0630	0.0980	-0.0235	0.1305	0.0353
	(0.0526)	(0.1107)	(0.0792)	(0.1142)	(0.0888)	(0.0922)
Female	**0.5320**	-0.0996	-0.0653	0.2650	-0.0611	0.1445
	(0.1321)	(0.2783)	(0.1975)	(0.2564)	(0.2148)	(0.2212)
Age under 30	**0.4871**	0.0411	0.0823	0.0388	-0.1775	-0.0284
	(0.2344)	(0.4243)	(0.2992)	(0.4026)	(0.3572)	(0.2913)
Age 30-39	-0.1751	0.6251	0.0822	-0.1670	0.1654	0.5553
	(0.2200)	(0.3804)	(0.3057)	(0.3961)	(0.3446)	(0.3083)
Age 50-59	0.1829	0.0496	-0.1354	-0.0474	-0.2161	-0.1884
	(0.2065)	(0.5275)	(0.3428)	(0.3921)	(0.3949)	(0.4838)
Age 60-69	0.3621	0.3793	-0.6859	-0.3276	0.3846	-0.3447
	(0.2115)	(0.4656)	(0.3692)	(0.4506)	(0.3832)	(0.4234)
Age 70 and older	0.2496	0.3199	-0.7072	-0.2316	0.1369	-0.0974
	(0.2644)	(0.6976)	(0.3800)	(0.5462)	(0.3935)	(0.6236)
Constant	-2.2249	-2.9727	-1.9422	-3.0149	-1.8010	-2.4078
	(0.2818)	(0.5649)	(0.4136)	(0.5835)	(0.4358)	(0.3894)
Number of respondents	1228	1157	1476	1078	981	2816
AIC	1431	564	1079	598	666	1424

Table A5.5 (cont'd)

	Spain	Sweden	Switzerland	Turkey	Great Britain	United States
Dangerousness of climate change	**0.2634**	**0.4857**	**0.1705**	-0.3446	**0.8343**	**0.4167**
	(0.0977)	(0.0769)	(0.0800)	(0.1854)	(0.2215)	(0.0889)
Left party identification	0.0988	**0.6745**	**0.4940**	0.3413	-0.1169	0.1234
	(0.1856)	(0.2145)	(0.1631)	(0.4565)	(0.4165)	(0.5184)
Right party identification	-0.3127	0.2670	-0.2977	0.0475	-0.0838	-0.4400
	(0.2571)	(0.2441)	(0.1721)	(0.3554)	(0.4366)	(0.5464)
Level of education	-0.0665	0.0407	**0.1518**	-0.2246	0.1867	**0.1998**
	(0.0670)	(0.0502)	(0.0527)	(0.1644)	(0.1077)	(0.0819)
Female	-0.1492	0.1534	0.1989	-0.2039	-0.2079	-0.1888
	(0.1462)	(0.1498)	(0.1369)	(0.3331)	(0.3044)	(0.1884)
Age under 30	0.0870	0.4150	0.0566	0.6996	-0.0967	0.5135
	(0.2173)	(0.2455)	(0.2186)	(0.5488)	(0.5379)	(0.3293)
Age 30-39	-0.3684	**0.5605**	-0.3599	0.2588	-0.1431	**0.6415**
	(0.2196)	(0.2493)	(0.2386)	(0.5657)	(0.4590)	(0.3182)
Age 50-59	-0.1333	0.1681	0.2524	0.7468	0.0663	0.4029
	(0.2307)	(0.2478)	(0.2088)	(0.5923)	(0.4922)	(0.3301)
Age 60-69	-0.5251	0.1192	0.2428	-0.8235	-0.5370	0.4258
	(0.2954)	(0.2421)	(0.2251)	(1.1243)	(0.5563)	(0.3289)
Age 70 and older	**-0.7368**	0.4717	0.0223	0.5816	0.8562	**0.8987**
	(0.3180)	(0.2810)	(0.2432)	(0.7379)	(0.5178)	(0.3625)
Constant	-2.8530	-3.1425	-1.5247	-3.1073	-4.5472	-3.5748
	(0.3517)	(0.3509)	(0.2805)	(0.8017)	(0.7326)	(0.6114)
Number of respondents	2351	1036	1158	1493	706	1239
AIC	1417	1137	1359	385	420	906

Notes: Cell entries are logistic regression coefficients with the standard error in parenthesis. Listwise deletion was used for missing values. **Bold** indicates two-tailed $p<0.05$. Models include individual survey weights. Israel and Taiwan were not included in the models because respondents were not asked for their partisan identification in these two countries.

Figure A5.1a: Effect of perceived dangerousness of climate change on considering the environment the most or next most important issue for country across natural logarithm of mean GDP per capita by country (International Social Survey Programme 2009-2011)

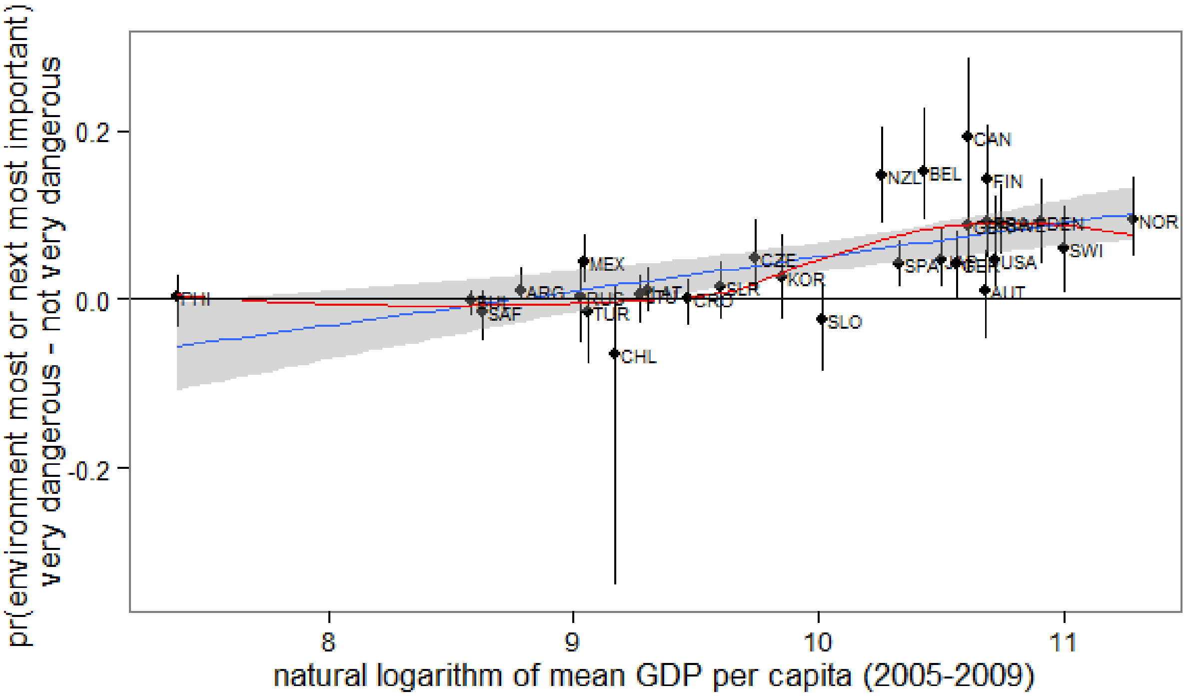
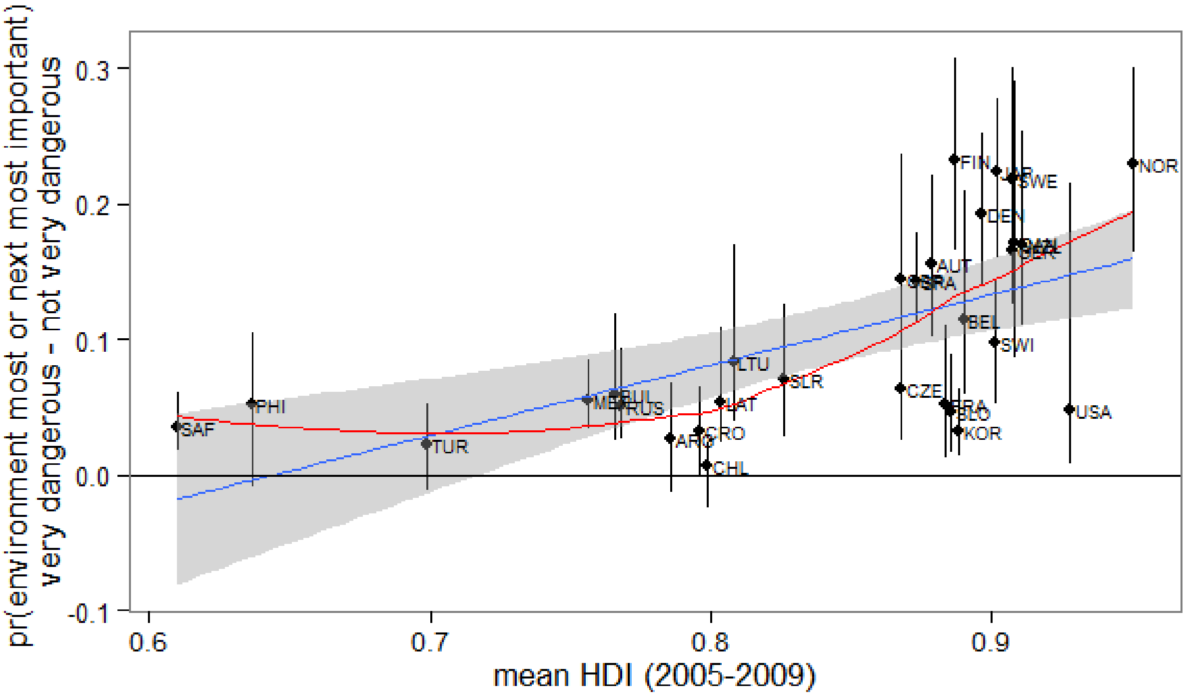


Figure A5.1b: Effect of perceived dangerousness of climate change on considering the environment the most or next most important issue for country across natural logarithm of mean HDI by country (International Social Survey Programme 2009-2011)



Notes: The blue line is the OLS line of best fit and the blue region is its 95 percent confidence interval. The red line is the loess line of best fit. And the vertical error bar is the 95 percent confidence interval for the estimated difference in the predicted probability for ranking the environment as the most or next most important issue setting perceived dangerousness of climate change at "very dangerous" and "not very dangerous" for each country, controlling for other factors. The statistical models used to produce this figure are presented in Table A5.5.

Table A5.6: Logistic regression models predicting considering climate change the most important environmental problem, by country (International Social Survey Programme 2009-2011)

	Argentina	Austria	Belgium	Bulgaria	Canada	Chile
Dangerousness	0.2624	**0.7505**	**0.7796**	**0.5530**	**1.1148**	0.1306
of climate change	(0.1721)	(0.1103)	(0.1019)	(0.1710)	(0.1478)	(0.1840)
Left party identification	-0.0240	0.2143	-0.0114	-0.4232	0.2620	0.5216
	(0.3952)	(0.2077)	(0.3576)	(0.3130)	(0.2834)	(0.3829)
Right party identification	1.2040	0.0359	0.3216	0.7653	0.2197	0.3848
	(0.8030)	(0.2071)	(0.3511)	(0.4014)	(0.3376)	(0.4577)
Level of education	0.0098	0.0897	0.0396	0.0402	0.1767	0.1681
	(0.1013)	(0.0738)	(0.0901)	(0.1241)	(0.0905)	(0.1637)
Female	-0.0109	0.2019	0.1982	-0.1528	-0.2696	0.3151
	(0.2591)	(0.1726)	(0.1985)	(0.2800)	(0.2318)	(0.3158)
Age under 30	-0.1673	0.2376	0.2660	-0.0530	0.1795	0.1306
	(0.3866)	(0.2498)	(0.2988)	(0.4645)	(0.3641)	(0.4215)
Age 30-39	-0.2655	-0.0251	0.1776	0.0609	0.5423	0.3990
	(0.4069)	(0.2868)	(0.3072)	(0.4659)	(0.3969)	(0.5001)
Age 50-59	-0.4175	0.1408	0.0044	-0.6243	0.0008	-0.0935
	(0.4274)	(0.2691)	(0.3090)	(0.4535)	(0.3185)	(0.4580)
Age 60-69	-0.3445	0.1163	-0.5675	-0.7767	-0.0632	-0.6979
	(0.4668)	(0.3022)	(0.3705)	(0.4741)	(0.3485)	(0.6971)
Age 70 and older	-0.7609	-0.3592	-0.8758	0.0195	0.0608	1.1192
	(0.5364)	(0.3679)	(0.4635)	(0.4367)	(0.3728)	(0.6737)
Constant	-3.2815	-3.5333	-4.0581	-3.8963	-4.7460	-3.7494
	(0.6410)	(0.4188)	(0.4847)	(0.6401)	(0.6329)	(0.8125)
Number of respondents	1078	937	1010	903	881	1371
AIC	512	984	754	476	833	605

Table A5.6 (cont'd)

	Croatia	Czech Republic	Denmark	Finland	France	Germany
Dangerousness	**0.2130**	**0.4199**	**0.5787**	**0.7936**	**0.3420**	**0.6438**
of climate change	(0.1071)	(0.1153)	(0.0780)	(0.0826)	(0.1334)	(0.0763)
Left party identification	0.3538	-0.2171	0.2840	-0.2874	0.2629	0.0548
	(0.3683)	(0.2541)	(0.1854)	(0.1972)	(0.3144)	(0.1490)
Right party identification	-0.9676	0.2684	0.2690	0.0693	-0.1057	-0.1112
	(0.5968)	(0.2466)	(0.1819)	(0.2083)	(0.2974)	(0.1847)
Level of education	-0.0669	-0.0256	-0.0038	0.0125	0.0578	0.0901
	(0.0923)	(0.1016)	(0.0793)	(0.0717)	(0.0831)	(0.0475)
Female	0.2902	0.2224	-0.0553	-0.1999	0.1797	0.1830
	(0.2014)	(0.2122)	(0.1470)	(0.1682)	(0.2412)	(0.1335)
Age under 30	-0.1872	-0.5074	-0.0902	-0.2096	0.0631	-0.0975
	(0.3012)	(0.3133)	(0.2374)	(0.2599)	(0.3866)	(0.2154)
Age 30-39	-0.1974	-0.5207	-0.3798	-0.2298	-0.2438	0.1424
	(0.3083)	(0.3484)	(0.2338)	(0.2605)	(0.3322)	(0.2239)
Age 50-59	-0.0430	-0.7006	-0.0826	-0.2152	**-0.9297**	0.1979
	(0.3031)	(0.3582)	(0.2098)	(0.2504)	(0.3199)	(0.2070)
Age 60-69	**-1.0814**	-0.2787	-0.4222	-0.2190	**-0.6328**	-0.3085
	(0.4190)	(0.3137)	(0.2425)	(0.2593)	(0.2804)	(0.2302)
Age 70 and older	0.1200	-0.2244	**-1.3106**	**-1.2080**	**-0.8275**	0.1097
	(0.3807)	(0.3788)	(0.3414)	(0.5310)	(0.3120)	(0.2279)
Constant	-2.7959	-3.2471	-2.4738	-3.1156	-3.0295	-3.0121
	(0.4093)	(0.3708)	(0.3057)	(0.3133)	(0.4340)	(0.2971)
Number of respondents	1136	1309	1103	1100	1938	1256
AIC	751	765	1189	1058	1197	1403

Table A5.6 (cont'd)

	Japan	South Korea	Latvia	Lithuania	Mexico	New Zealand
Dangerousness	**0.4730**	**0.4238**	**0.4834**	**0.7488**	**0.7095**	**0.8522**
of climate change	(0.0714)	(0.0946)	(0.1256)	(0.1835)	(0.1450)	(0.1156)
Left party identification	0.1959	0.5792	-0.1540	**-1.2808**	-0.0977	**-0.7232**
	(0.1534)	(0.3403)	(0.3077)	(0.5866)	(0.1907)	(0.2703)
Right party identification	-0.0783	0.3259	-1.0140	-1.9656	0.0794	**-0.4836**
	(0.1559)	(0.3587)	(1.0314)	(1.0381)	(0.2683)	(0.2437)
Level of education	0.0097	0.1244	**-0.1811**	-0.0554	-0.0097	0.1151
	(0.0513)	(0.0805)	(0.0898)	(0.1527)	(0.0650)	(0.0844)
Female	0.1026	0.1222	0.0813	-0.3469	0.0188	0.0659
	(0.1210)	(0.1574)	(0.2524)	(0.3368)	(0.1788)	(0.2206)
Age under 30	-0.4001	**0.6745**	0.0038	-0.3311	0.1062	0.1657
	(0.2157)	(0.2295)	(0.4165)	(0.4740)	(0.2689)	(0.3229)
Age 30-39	**-0.4438**	**0.6516**	0.1127	-0.6321	0.4216	-0.0397
	(0.2067)	(0.2180)	(0.4589)	(0.6551)	(0.2779)	(0.3060)
Age 50-59	-0.0347	-0.2940	-0.1819	-0.5991	0.2966	-0.4357
	(0.2065)	(0.3294)	(0.4740)	(0.5365)	(0.3155)	(0.3405)
Age 60-69	-0.1136	-0.6337	0.2485	0.1899	-0.1250	**-0.9682**
	(0.2052)	(0.4395)	(0.4648)	(0.4640)	(0.4035)	(0.3711)
Age 70 and older	-0.1579	-0.1306	0.6738	-0.9606	-0.4723	-0.4931
	(0.2245)	(0.4099)	(0.4466)	(0.5460)	(0.4553)	(0.3993)
Constant	-1.2822	-4.0209	-3.7377	-4.2992	-4.6467	-3.7954
	(0.2834)	(0.4620)	(0.5065)	(0.6919)	(0.5871)	(0.4052)
Number of respondents	1195	1498	872	912	1397	1014
AIC	1614	1125	496	384	935	719

Table A5.6 (cont'd)

	Norway	Philippines	Russia	Slovak Republic	Slovenia	South Africa
Dangerousness	**0.6953**	0.1719	**0.4625**	**0.5249**	**0.4419**	**0.4474**
of climate change	(0.0730)	(0.0945)	(0.1132)	(0.1687)	(0.1376)	(0.0937)
Left party identification	0.3056	-0.3983	0.1488	0.0647	0.3631	-0.2231
	(0.1987)	(0.3257)	(0.2212)	(0.2584)	(0.3181)	(0.2129)
Right party identification	0.0119	-0.1219	0.5568	0.3406	**0.8046**	0.2991
	(0.2278)	(0.3605)	(0.4826)	(0.5302)	(0.2655)	(0.6742)
Level of education	**0.1224**	0.0427	**-0.2220**	0.1482	0.0064	0.1003
	(0.0555)	(0.0687)	(0.1032)	(0.0949)	(0.1032)	(0.0796)
Female	-0.1845	**-0.3737**	0.1785	**-0.5374**	-0.1464	-0.1916
	(0.1381)	(0.1810)	(0.2251)	(0.2348)	(0.2315)	(0.2060)
Age under 30	-0.1984	-0.4373	-0.4132	0.2478	-0.1740	0.4920
	(0.2370)	(0.2702)	(0.3529)	(0.3556)	(0.3714)	(0.2741)
Age 30-39	-0.4146	-0.1875	0.1807	-0.2496	0.0112	**0.7442**
	(0.2272)	(0.2566)	(0.3244)	(0.3702)	(0.3754)	(0.3080)
Age 50-59	-0.0423	-0.0124	-0.4660	-0.0691	0.3346	0.6283
	(0.2130)	(0.2896)	(0.3664)	(0.3536)	(0.3536)	(0.3662)
Age 60-69	0.0422	-0.1227	**-0.8323**	-0.3227	-0.1093	0.4170
	(0.2147)	(0.3365)	(0.4017)	(0.4369)	(0.4158)	(0.4177)
Age 70 and older	-0.0963	-0.4238	**-0.8794**	-1.1141	-0.8453	0.2344
	(0.2865)	(0.4684)	(0.4046)	(0.6627)	(0.4820)	(0.4802)
Constant	-2.6936	-1.7207	-3.7189	-3.5827	-3.7172	-4.0532
	(0.3040)	(0.3657)	(0.4613)	(0.6248)	(0.4945)	(0.4199)
Number of respondents	1220	1174	1462	1054	995	2772
AIC	1345	1072	830	601	593	1711

Table A5.6 (cont'd)

	Spain	Sweden	Switzerland	Turkey	Great Britain	United States
Dangerousness	**0.4988**	**0.7588**	**0.3976**	0.1786	**0.6007**	**0.9587**
of climate change	(0.0648)	(0.0906)	(0.0955)	(0.1276)	(0.1334)	(0.1266)
Left party identification	0.1773	0.1411	-0.0288	-0.6620	0.2435	0.9479
	(0.1328)	(0.2146)	(0.2004)	(0.3966)	(0.2987)	(0.8554)
Right party identification	0.0237	-0.0856	0.0959	0.0303	-0.3481	0.6021
	(0.1582)	(0.2441)	(0.1900)	(0.2375)	(0.3282)	(0.8932)
Level of education	0.0581	0.0662	**0.1832**	0.0753	**0.2027**	**0.3306**
	(0.0398)	(0.0558)	(0.0589)	(0.0880)	(0.0767)	(0.1173)
Female	-0.0717	-0.2222	-0.0457	-0.0749	-0.2050	**-0.5558**
	(0.1002)	(0.1643)	(0.1580)	(0.2248)	(0.2213)	(0.2296)
Age younger than 30	0.1020	-0.3118	-0.0244	-0.1427	-0.0518	0.1518
	(0.1577)	(0.2599)	(0.2569)	(0.2997)	(0.3828)	(0.3697)
Age 30-39	0.0750	0.1832	0.0524	-0.4827	0.5186	-0.0753
	(0.1474)	(0.2511)	(0.2592)	(0.3258)	(0.3128)	(0.3704)
Age 50-59	-0.0794	-0.5030	-0.0198	-0.2251	0.1608	-0.2318
	(0.1632)	(0.2616)	(0.2454)	(0.3957)	(0.3440)	(0.4155)
Age 60-69	-0.3056	-0.4584	-0.1331	-0.6357	-0.0767	-0.2138
	(0.1904)	(0.2586)	(0.2695)	(0.5153)	(0.3712)	(0.3797)
Age 70 and older	**-0.6960**	-0.2217	-0.4132	-1.1214	0.1183	0.3811
	(0.2079)	(0.3166)	(0.3019)	(0.7576)	(0.4112)	(0.4143)
Constant	-2.5529	-3.0832	-2.5392	-2.9117	-2.9869	-5.6751
	(0.2346)	(0.3640)	(0.3327)	(0.5091)	(0.4885)	(0.9953)
Number of respondents	2340	1021	1169	1510	685	1168
AIC	2529	989	1069	687	702	712

Notes: Cell entries are logistic regression coefficients with the standard error in parenthesis. Listwise deletion was used for missing values. **Bold** indicates two-tailed $p<0.05$. Models include individual survey weights. Israel and Taiwan were not included in the models because respondents were not asked for their partisan identification in these two countries.

Figure A5.2a: Effect of perceived dangerousness of climate change on considering climate change the most important environmental problem facing country across natural logarithm of mean GDP per capita by country (International Social Survey Programme 2009-2011)

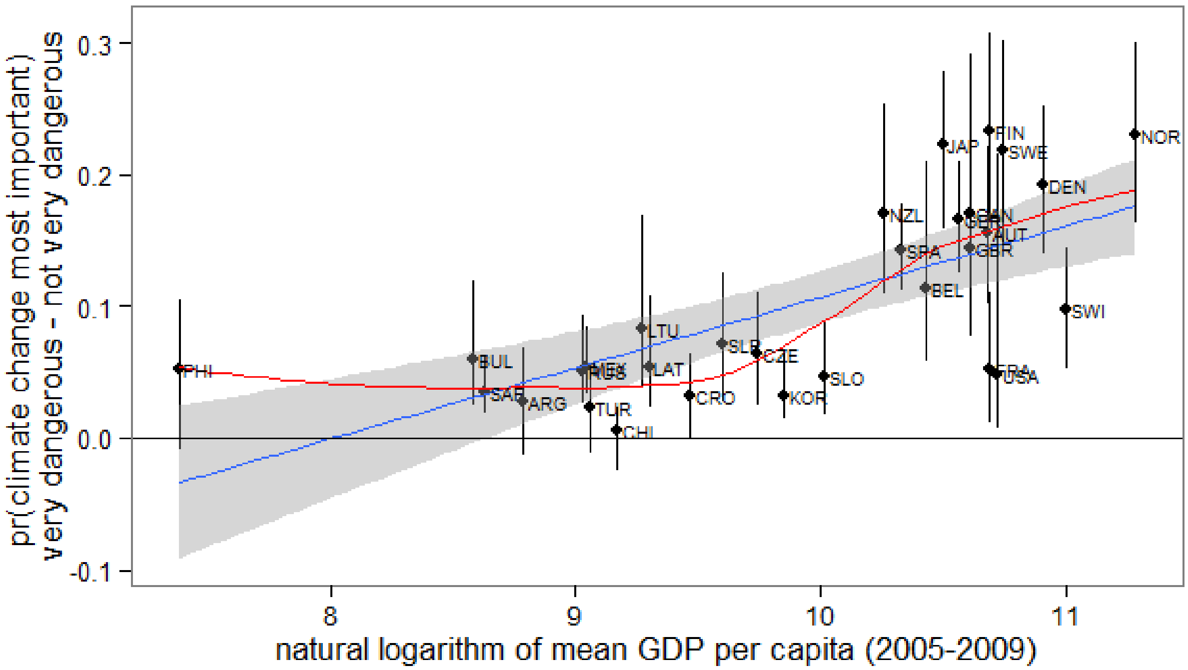
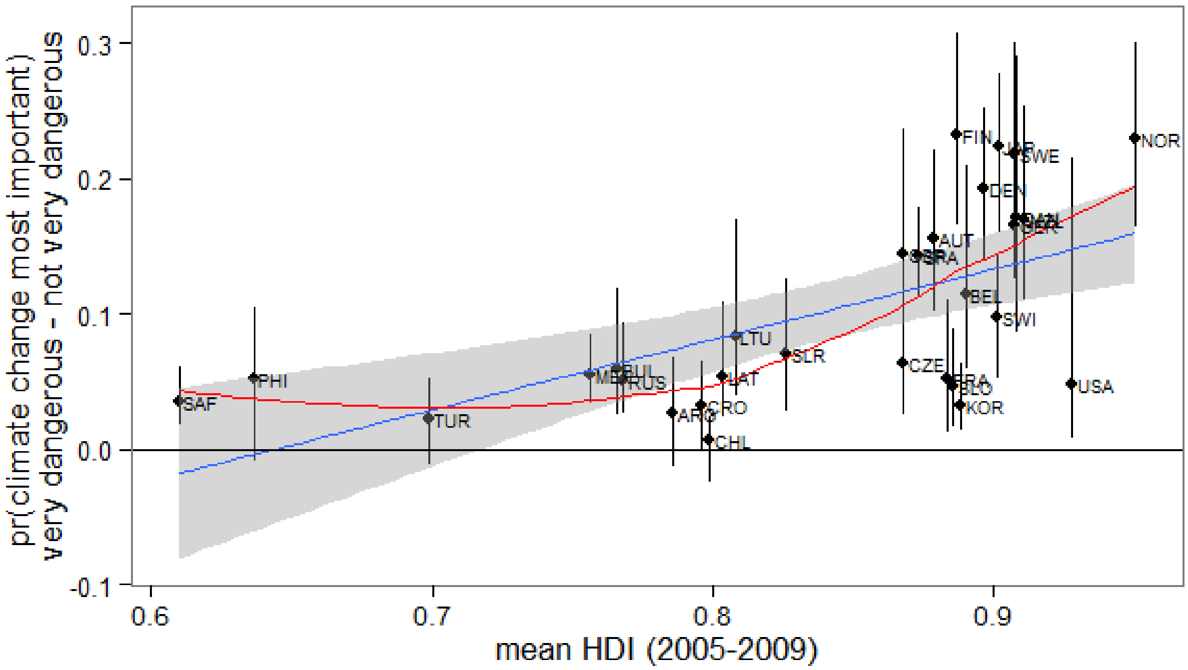


Figure A5.2b: Effect of perceived dangerousness of climate change on considering climate change the most important environmental problem facing country across mean HDI by country
(International Social Survey Programme 2009-2011)



Notes: The blue line is the OLS line of best fit and the blue region is its 95 percent confidence interval. The red line is the loess line of best fit. And the vertical error bar is the 95 percent confidence interval for the estimated difference in the predicted probability for ranking climate change as the most important environmental problem facing their country, setting perceived dangerousness of climate change at “very dangerous” and “not very dangerous” for each country, controlling for other factors. The statistical models used to produce this figure are presented in Table A5.6.

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